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CHRONIC HUMAN AMEBIASIS

A REVIEW OF THE DIAGNOSIS AND TREATMENT ON THE BASIS OF ENCYSTMENT IN THE LIVER AREA

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It is a common statement in or inference from the literature of amebiasis that encystment of *Endameba dysenteriae* occurs only in the colon. It is also generally supposed that the cysts of *E. dysenteriae* are not vulnerable to emetin hydrochlorid. During six years' experience in the diagnosis and treatment of human amebiasis, and especially in the last three and a half years in observing and treating those persons with amebiasis who have at the same time chronic hypertrophic arthritis, clinical features have appeared that do not seem susceptible of satisfactory explanation, if one is restricted to the concept that encystment of the amebas is confined to the colon alone. In chronic amebiasis, one is often struck by the appearance of partial improvement under specific therapy, followed by a neutral period, and then often by retrogression. Retrogression is quite often associated with the advent of colds, influenza, chilling, etc.

On attempting to visualize the disease process, the following questions arise: Does partial improvement or incomplete recovery mean that the patient's illness has other factors in its causation, in addition to the amebiasis, or does it mean that something occurs in the life cycle of the ameba which can explain the clinical behavior? The first question can be answered in the negative in numerous instances, by careful examination of the patient and elimination of possible factors other than amebiasis. The second question may possibly be answered in time with certainty in the affirmative. It is interesting that these retrogressions partake of the characteristics of the original syndrome and often appear out of proportion to the severity of the intercurrent infection. One is then led to the conception of depression of the host's resistance by the intercurrent cold or other factor, and a prompt lighting up of the original amebic infection, which may have been encysted, and which has not been actually eradicated. That is, on analysis, one is led to conclude on clinical evidence that arrested improvement during the course of specific therapy and the initiation of a retrogression that is typical of the original syndrome quite possibly mean that specific treatment was successful in eradicating only the motile phase, but not the hardy phase of the infection; i. e., that in which encystment may have occurred.

In this connection one recalls that cysts of *E. dysenteriae* are invulnerable to emetin hydrochlorid. Are they possibly also resistant in the presence of emetin bismuth iodid? Whatever is the ultimate answer to this question, one can arrive, by clinical reasoning, at a concept of encystment occurring in the host, outside of the feces in the colon. This encystment may be conceived as coinciding in time with, or perhaps persisting throughout, the neutral period so often seen in the course of treatment of human amebiasis by specific therapy, with emetin in some form or other. The lull of arrested development in the patient continues until circumstances adverse to the ameba are removed, and until circumstances adverse to the host arise. That is, the neutral period occurs when the patient's intolerance to specific therapy has been reached, and one must desist out of regard for safety to merge into actual retrogression on the advent of depressing factors, such as colds, influenza, worry, fatigue, chilling and constipation.

In analyzing cases of human amebiasis, it is remarkable how often a mild colitis is found as a characteristic sign. In a list of several hundred cases extending over a period of several years, only one case has been found in which there was no colitis demonstrable by sigmoidoscopy. In this instance there may have been a mild typhlitis. Bearing in mind this mild colitis, and observing that a high percentage of cases also showed apparent enlargement of the right lobe of the liver with a sensitive liver edge, the medical author was forced to the concept of early mild hepatitis occuring in the majority of cases. This view, of course, has had added support in the protozoological findings of *Endameba dysenteriae* in the invaded capillaries of the colon.[1]

As shown in Figures 1 and 2, from a section of the colon adjacent to an amebic ulcer in a fatal case of human amebiasis, one finds, outside of the muscularis in the capillaries and small blood vessels of the serosa, abundant evidence that the amebas have entered the blood stream and are thus in a position to find their way in the hepatic portal stream to the liver. The hematogenic mode of distribution of amebas from colonic infections is thus provided for by this invasion of the blood stream into other organs of the body, such as bone, lymph glands and skin.

1. Kofoid, C. A.; Boyers, L. M., and Swezy, Olive: Systemic Infections by Endameba Dysenteriae, Proceedings of the International Conference on Health Problems in Tropical America, held at Kingston, Jamaica, B. W. I., July 22 to Aug. 1, 1924, by invitation of the Medical Department, United Fruit Company (Boston, United Fruit Company), pp. 381-399.

PREVIOUS CONCEPTS

To recapitulate, the sequence of concepts has been as follows:

The cysts of *E. dysenteriae* are not vulnerable to emetin hydrochlorid. Although this statement may not be absolutely true, the relative resistance of these cysts is so high that no case of amebiasis can be completely eradicated by the use of emetin hydrochlorid alone. This is indicated in the experimental results of the British Medical Research Council.

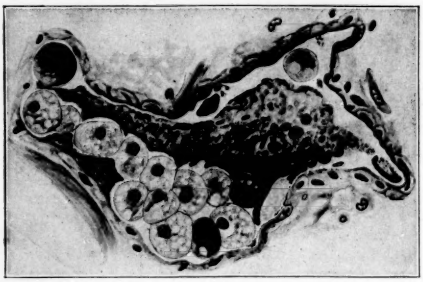

Fig. 1.—Cross section of small vein in the wall of the colon immediately outside the muscularis near the margin of an amebic ulcer, showing fifteen amebas in a single section; × 460; after Kofoid (Amoeba and Man, University of California Chronicle, April and July, 1923, Plate 4, Figure 42).

In the treatment of chronic amebiasis, one does get improvement by specific therapy, but in many cases, especially in those of chronic hypertrophic arthritis and in those with apparent involvement of the liver area, this improvement does not lead to complete recovery. The case is oftener arrested, the patient entering a neutral phase in which there is neither progression nor retrogression. In watching numbers of these cases, one is constantly tantalized by this more or less neutral period, and is led irresistibly to the concept that it coincides with the existence of encysted stages of the parasite, with only slight returns to activity. Since the medical author has come to treat amebiasis entirely on the basis of the patient's tolerance for specific therapy, and since the neutral periods may have occurred after quite intensive treatment—the actual reaching of the limit of the patient's tolerance—one is again led to the concept of encystment of the parasite occurring after a period of treatment and bringing to a halt the process of eradication. Whether or not this is a protective reaction on the part of the parasite is not known. As one observes these neutral periods, little of moment is seen in the course of the disease until the patient is subjected to some assault, such as chilling, fatigue, worry, colds or influenza. Then one usually sees an end to the neutral period and the beginning of actual retrogression. Apparently excystment is under way, and the original syndrome appears with the lighting up of the disease process. The same rise and fall can be followed in the colitis and the hepatitis, each tissue apparently telling the same story of partial eradication, encystment, excystment, and renewed activity of the infection.

This train of thought was followed for several years before added observation brought to light cases presenting not only mild chronic appendicitis and typhlitis, but, as often observed at celiotomy, perityphlitis, pericolitis and pericholecystitis, occurring concurrently with clinical amebiasis with proved laboratory confirmation of the diagnosis.

These observations were made during the use of surgery, combined with the clinical concept of general mild hepatitis, and the reasoning of encystment and specific therapy heretofore outlined led the medical author to take two steps. First, some ten or twelve months ago a statement was made to the protozoologists that encystment must occur outside the colon, if one is to account rationally for the clinical behavior of cases. Secondly, some six months ago routine duodenal drainage was instituted, to secure a check on the liver area, and examinations paralleling fecal examinations were made; both of these procedures took place under the stimulation of bile salts and salines by mouth.

PRESENT CONCEPT

Before proceeding further with our revision, it may be helpful to indicate our present concept of clinical amebiasis. It has been possible for the last two years to say that there is a definite disease entity that can be recognized by clinical means as chronic amebiasis. According to our own records, this is so definite that fully 95 per cent. of cases can be diagnosed clinically, before laboratory confirmation is obtained.

The process of arriving at a clinical diagnosis of amebiasis involves a complete history, taken with more than usual care, because of the great need of particular attention being paid to vague symptoms and their sequence. It is hardly possible to be too careful in eliciting this history. All the minor and major illnesses of the individual, as well as his physical and mental peculiarities, are recorded against a background of heredity and environment. The question of environ-

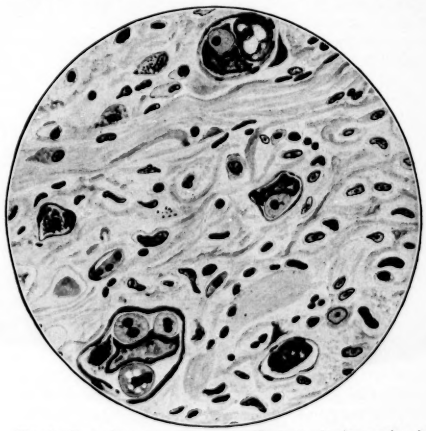

Fig. 2.—From the same section as in Figure 1, showing amebas in several small vessels; × 380.

ment is elaborated to make a record of the individual's residence during life, as to state or country. Certain well known areas containing endemic foci contribute largely to the chance of infection with protozoan parasites. The fruitful way of dealing with these cases is to attack them with a desire to find every factor and every disease process involved in the case whether or

not it interacts with the amebiasis. Amebic infection is of long duration in the host, and the way to arrive at a just estimate of its prevalence and its importance to human welfare is to seek to define accurately the limits of its invasion, both in human tissue and in the social body.

Nearly all individuals of the white race seem to be susceptible to chronic amebiasis. The two sexes seem equally vulnerable, although certain tissues are possibly more easily invaded in one sex than in the other. In the Caucasian race no sufficient observation has been made to indicate increased susceptibility of blond over brunette, or vice versa. There is a well defined feeling, however, that some of the dark peoples, such as the negro, the East Indian, the Chinese, the Japanese and the Filipino, show more tolerance of *E. dysenteriae* in the bowel than does the white man. However, this is merely an impression.[2]

In this connection, one is reminded of the question of carriers. Over a period of years, constant search has been made for a true carrier, but as yet only one individual has been found by the medical author in more than 500 cases who showed no visible tissue damage attributable to *E. dysenteriae*. The behavior of cases in the temperate zone suggests that *E. dysenteriae* meets with a number of adverse conditions that help to create a subtle picture of chronicity. Whether this tendency to chronicity in large numbers of persons in the temperature zone means an actual relative immunity is not known. One is only able to say that, to date, but one individual has been found with no visible tissue damage, and he may have had considerable damage in areas not open to the eye. This particular individual, it may be worth noting, died later of arteriosclerosis.

SYMPTOMS

In symptomatology, one of the salient facts is that persons with amebiasis commonly complain of fatigability. They go to bed tired, and arise in the morning tired; they are tired whether they work or rest; many of them are so tired that they are in actual anguish; others merely say they have lost their "pep." Very commonly associated with fatigability is constipation, or constipation interspersed with evanescent diarrheas. Occasionally one will elicit the passing of considerable quantities of mucus or blood. A normal man knows hunger and the desire for evacuation; otherwise his bowel does not obtrude on his consciousness. In amebiasis the patient often has no actual pain. On the other hand, he is not comfortable in the abdominal region. He is, as we say, "bowel conscious." He may have considerable flatulence. He may or may not complain of definite soreness in the right lower quadrant, in the right upper quadrant, or in the region of the splenic flexure. He may complain of neuritic symptoms, pain along the course of some particular nerve or nerves. He may complain of basal headache, or of pain and aching in the region of joints. He may have considerable digestive disturbance, referable to the upper abdomen, that leads to the clinical suspicion of hyperacidity, hypo-acidity, gastric and duodenal ulcers, chronic pancreatitis, chronic cholecystitis, chronic duodenitis or chronic hepatitis. He may complain of cough and expectoration, with bloody sputum. He may complain of rapid pulse, and one may see mild tachycardias. He may complain of much nervousness, and one may find in him symptoms of a subacute or chronic thyroiditis. He may complain of defective vision, and one may find greatly impaired vision with or without definite iritis. Some may complain of disabling loss of memory, while others show various neuroses. One may find also the grosser lesions of liver abscess, lung abscess, brain abscess, skin ulcers, etc. The matter can be summed up by saying that in chronic amebiasis we are dealing with a disease entity as protean as syphilis.

In discussing with the patient his past history, it is important to note such quoted diagnoses as nervous breakdown, neurasthenia, incipient tuberculosis, tuber-

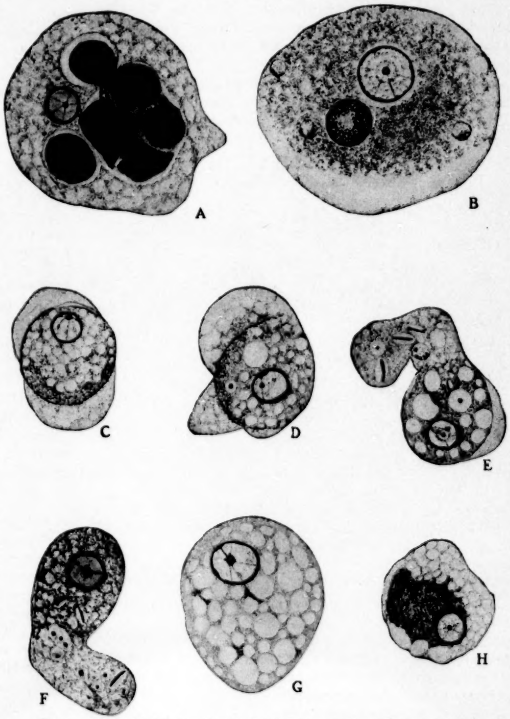

Fig. 3.—Motile Endamebae dysenteriae from the detritus of duodenal drainage: *A*, *B*, *E* and *F* are from Flask 2, and *C*, *D*, *G* and *H* from Flask 4. *A* contains partially digested leukocytes, and *B* a red blood corpuscle. Structures resembling bacteria appear in *E* and *F*; slightly reduced from a drawing with a magnification of 2,500 diameters.

2. Since the foregoing was written, the authors, through the courtesy of the United Fruit Company, have had the opportunity to observe the incidence and severity of amebiasis in both acute and chronic phases among negroes and varying race mixtures among the coastal peoples at Santa Marta, Colombia and also at Panama. We are less impressed than we formerly were as to the existence of a difference in tolerance to human amebiasis between the Caucasian and the darker races, at least so far as this pertains to these negroid and Indian admixtures.

culosis without the actual finding of tubercle bacilli, constipation, diarrhea, the passing of mucus, the passing of blood, hemorrhoids without the actual demonstration of hemorrhoids, neuritis or chronic rheumatism.

Human amebiasis is a definite disease entity, protean in character as is syphilis, undramatic in behavior, subtle in its onset, and definitely nonbacterial in type. We have been highly trained in thinking from the bacterial point of view since the days of Pasteur, and, on the whole, poorly trained in thinking from the point of view of protozoan infection. One commonly associates with the bacterial point of view such findings as fever, redness, swelling, acute pain, and more or less characteristic blood and urinary pictures. From the protozoan point of view, the very absence of these old guides may be highly significant. It is suggestive to recall that the bacteria are minute plant forms, and are often intolerantly regarded by human tissue cells. Protozoa are minute animal forms, and are often

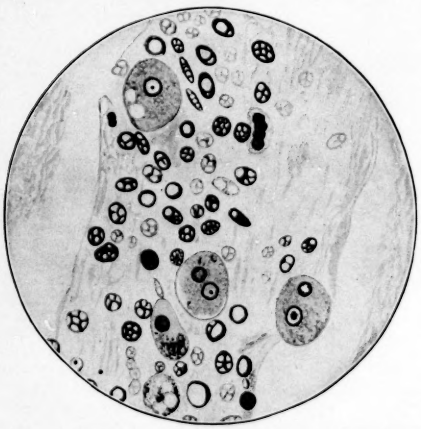

Fig. 4.—A shred of mucus from duodenal drainage with contents and three recognizable amebas in situ in the mucus and remnants (?) of two others; reduced from a drawing with a magnification of 730 diameters.

tolerantly regarded by human tissues for considerable periods of time. From this point of view one comes to realize that when bacterial infection is not demonstrable, one is not necessarily justified in a diagnosis of functional disturbance, or of normality, but very often may be dealing with a chronic amebic infection.

It is worth a strenuous effort to try to eliminate other possible factors before arriving at a clinical diagnosis of amebiasis. The dearth of the usual findings to account for the patient's symptoms should make one suspicious of an amebic infection, especially if the symptoms are vague in character. One should not be content with the ready estimate that there is nothing really wrong physically, or that the disturbance is "functional." Such relatively insignificant findings as sensitiveness in the region of the cecum, a slightly enlarged right lobe of the liver with sensitive liver edge, sensitive splenic flexure, vague nerve and joint pains, and a general air of depression, may in the end be accounted for by the demonstration of chronic intestinal infection. The physician needs to become very sensitive to the picture of toxemia, no matter through what tissue or organ it presents itself.

Sigmoidoscopy in chronic amebiasis is necessary. Patients commonly believe that bleeding from the anus is due to hemorrhoids; this cannot be demonstrated on examination, the bleeding having been due to a mild colitis. One of the most valuable findings by sigmoidoscopy is this chronic colitis, which often is mild in grade and is characterized by the appearance in the mucosa of dilated vessels, pinpoint hemorrhagic areas, larger hemorrhagic areas, often granular mucosa, and occasionally free blood and abnormal amounts of mucus. It is surprising how often this mild colitis is interpreted as of no consequence, or overlooked entirely. In reality, it may be of the first significance, especially when considered in relation to symptomatology, past history, physical findings and the occurrence of cysts of *E. dysenteriae* detected by stool examination.

When identification of *Endameba dysenteriae* by cytologic criteria of the encysted stage was substituted for the older method of identification by the motile phase, a much more reliable method came into being. Further improvement in diagnostic methods ensued, when serial examinations of the feces were substituted for haphazard examination. Salines have proved useful in bringing to light amebic cysts or motile forms that might otherwise escape detection, but, with the routine use of bile salts as a cholagogue, an even better method has been substituted as a matter of routine. In fact, the use of bile salts has proved so effective in making demonstrable obscure infections with amebas that it has aroused suspicion that large numbers of amebas may be found commonly in the liver area, in chronic amebiasis, and this suspicion has led to our observations on the size of the liver, the sensitiveness of the liver edge and the frequency of accompanying gallbladder symptoms. Certainly in the light of our present knowledge, no fecal examination or duodenal examination is complete without the use of bile salts, with or without a saline.

POSSIBILITY OF CURE

For many years, tried and competent workers in the therapy of parasitic infections have been divided between two points of view, one group considering amebiasis insusceptible of cure; the other group considering it amenable to modern methods of treatment. This division in point of view is a challenge, and arouses curiosity as to why one often sees incomplete eradication of amebiasis.

Considerable light seems to have been thrown on this problem of incomplete eradication by our results on duodenal drainage. Amebas, both motile and encysted, have been found by us in the liver area. By analogy the question is raised as to whether or not they may also occur in other areas, such as about the joints and wherever either the intestinal stream or the circulatory stream tends to slow down.

In this connection it is well to bear in mind that encystment in protozoa generally is often regarded as a protective procedure providing for their resistance to desiccative or other adverse conditions. From this point of view, one would not predict encystment in the liver region, or elsewhere in the tissues. There is, however, another point of view; namely, that encystment is related to the metabolism of the protozoan. It often occurs among free-living protozoa in cultures in which food is abundant and no adverse conditions appear to be present. There is a possibility that

encystment may follow a period of abundant feeding and thus have a metabolic aspect, or that it may be a resultant of the interaction of some factor in the life cycle of the protozoan. There is as yet no satisfactory evidence that sexual reproduction occurs in any ameba, certainly not in any ameba parasitic in man, or that encystment follows syngamy. In any event there is no sound biologic evidence that encystment is primarily a protective device or that it might not occur in the case of *Endameba dysenteriae* in loci in the human host other than the lumen of the colon.

Whenever they do occur, they may not be entirely eradicated, perhaps because the encysted stage is hardy and possibly invulnerable to our present medicaments, and perhaps because one cannot quickly enough reach all parasites with a dose of sufficient concentration to kill. As in the old problem of syphilis, one may be tempted to search for a drug that will permit of a sterilizing dose. Perhaps, as in syphilis, such a drug will not be found, and one must, perforce, utilize his whole armamentarium, both medically and surgically, realizing that no one medicament is adequate and that only by the greatest resourcefulness can the actual cure of amebiasis be achieved.

TREATMENT

In the present position of the diagnosis and treatment of chronic amebiasis, patients should be impressed with the fact that treatment partakes of the nature of a campaign and not of a "cure," that is, patients with chronic amebiasis can be definitely bettered in health because of treatment, but the word "cure" carries with it too many implied promises, and may well be barred from the language of those who deal with amebiasis, for the present at least. It is wiser to tell patients with chronic amebiasis that, no matter how mild the infection appears, observation and treatment, including periodic examination, may easily occupy even as much as two years before the question of cure can be considered. Actual cure may be achieved in less time, but it should not be pronounced by the physician, without long and careful checking of both feces and duodenal contents. In the more severe cases, such as those with accompanying chronic hypertrophic arthritis, a combination of treatment, observation and checking may easily extend over a period of from three to five years. It may be well to note here that many cases of chronic hypertrophic arthritis do not appear to have so simple a causation as amebiasis alone. In many of these cases the factors are complex, including not only amebiasis, but also bacterial infections, seriously impaired metabolism, etc.

Duodenal drainage is done in the following manner:

The patient appears at the hospital or convalescent home in the morning without breakfast. The ordinary duodenal tube of the Rehfuss type is passed, and the patient is placed on the couch on his right side. A group of four flasks is made ready. Into Flasks 2 and 4 is put approximately 50 c.c. of Bouin's solution. The end of the duodenal tube is put into Flask 1 and left there until fluid begins to siphon away. When the fluid in Flask 1 begins to show a tinge of bile, the tube is passed into Flask 2, and the bile-stained fluid is allowed to run into the Bouin's solution, which acts as a fixative for the cellular material. When this drainage has continued for the matter of an hour, 125 c.c. of a warm, nearly saturated solution of magnesium sulphate is passed through the tube with the aid of a glass syringe. As much as possible of the magnesium sulphate solution is thereafter withdrawn by suction. Then the end of the tube is passed into Flask 3 and allowed to drain until all the magnesium sulphate solution is passed and the dark cystic bile begins to flow. With the appearance of the dark cystic bile, the tube is inserted into Flask 4, and the material is again thrown into contact with the fixative. Frequently one will wish to use a fifth flask containing Bouin's solution, in which to collect the so-called hepatic bile. The collected material in the flask is then centrifugalized and sent to the laboratory, where it may be stained and studied directly in the sediment, or infiltrated with paraffin, sectioned, stained and then studied.

Since duodenal drainage has been instituted as a check, 120 drainages on a total of fifty patients have been done by us. The patients furnishing the drainages, with the two exceptions noted below, have had a clinical diagnosis of pathogenic amebiasis confirmed by laboratory diagnosis. As a rule, in this series, they have been selected for duodenal drainage because each one has shown some refractory feature, either during or after specific therapy. Eleven of these persons, that is, eleven of the fifty, show positive duodenal findings of *E. dysenteriae*, either motile or encysted, or both, either in Flask 2, Flask 4, or both, and amebas have been found in one case in the duodenal drainage with six negative stools examined serially.

An analysis of these cases shows symptoms grouped as follows: one case with eye and colon symptoms predominating; thirty cases with stomach, liver, gall-

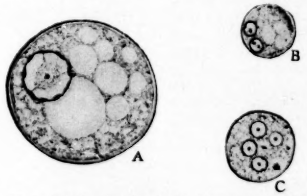

Fig. 5.—Cysts of Endameba dysenteriae from contents of Flask 4 in Case 50, with one, two and four nuclei, respectively; slightly reduced from a drawing with a magnification of 2,500 diameters.

bladder and colon symptoms predominating; fourteen cases with joint, nerve and colon symptoms predominating. The remaining six cases include a group in which infections of *Craigia hominis* and *Councilmania lafleuri* had been found, but no *Endameba dysenteriae* to date.

TYPICAL CASES

It will be of interest to summarize very briefly our experience with typical cases out of this group.

Case 1, referred to the medical member by Dr. Milton Shutes of Oakland, presented a most interesting symptom complex. The chief complaint was due to a chronic iritis with cataract.[3] The colon showed a high degree of inflammation, the visible mucosa being almost beefy in color. No free blood was seen. Since treatment, no further attacks of iritis have occurred, and the mucosa is much improved, the color being nearly normal. Two duodenal checks after treatment yielded negative results.

Case 6 illustrated the picture of gallbladder involvement. This patient came in complaining of a "kink in the back" that had endured two weeks, much discomfort in the region of the stomach, and much flatulence. His symptoms were worse from two to three hours after eating, and he complained definitely of weakness. Roentgen-ray observation showed a pathologic gallbladder, probable cholelithiasis, a chronic pathologic appendix, with adhesions, signs of colitis, and possible diverticula of the ascending colon. Specific therapy caused the disappearance of symptoms within four weeks, though an

3. Mills, L.: Amebic Iritis Occurring in the Course of Non-Dysenteric Amebiasis, Arch. Ophth. **52**: 525-545 (Nov.) 1923.

attack of influenza kept the patient uncomfortable for another month. He is at work and has had no further symptoms referable to bowel, appendix or gallbladder to date.

Case 22 illustrates disturbance in the liver area, with epileptiform seizures. When this young matron came under observation, she was suffering from great irritability and from two to four attacks a week. These attacks were preceded by a definite aura, and a violent headache accompanied by vomiting, both preceding and succeeding the attacks. Following specific therapy, which was given in three different courses, she has been free from these attacks for six months. Duodenal drainage itself has kept her improving. It has been repeated on the slightest hint of headache or aura, at lengthening intervals, until now the schedule indicates drainage every ten days. Recently *E. dysenteriae* was found in Flask 4 in concentrated cystic bile.

Case 10 was that of a person with chronic hypertrophic arthritis. This patient, a physician, suffered much and had to accept limited activity because of pain and increasing weakness, associated with a "toxic feeling." Under specific therapy, the joints receded in size and became more supple. Pain was much decreased. The patient commented on feeling better than in several years, having lost a sense of depression. On checking with duodenal drainage, *E. dysenteriae* was found in Flask 4, and vigorous treatment was again instituted.

Case 34 was another chronic hypertrophic arthritis. This patient had been confined to bed and wheel chair for about three years. She had much pain and disability, with atrophy of the joint structures. Roentgenray observation, however, showed thin disks of cartilage persisting in the joints. On specific treatment, she lost much of her pain, found her joints more supple, and has recently been able to stand and to take two steps, the first in more than three years. Duodenal drainage has recently shown *E. dysenteriae* in Flask 2.

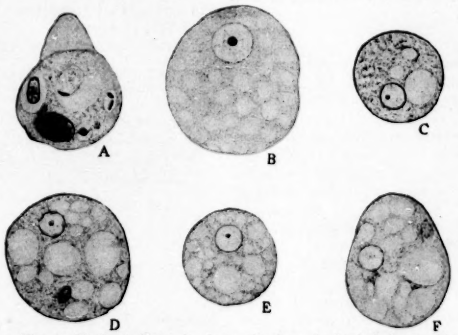

Fig. 6.—Moribund Endameba dysenteriae from duodenal drainage with signs of disorganization, from four different patients. *A*, *B* and *E* are from Flask 2, and *C*, *D* and *F* from Flask 4; slightly reduced from a drawing with a magnification of 2,500 diameters.

In the duodenal drainage the amebas are fixed by the Bouin's fluid immediately on their arrival in the flask. The condition in which they arrive in the flask is presumably preserved by the fixation, and will be indicative to an unknown degree of the condition in which they are found in the liver region. Three types are present in the detritus of the duodenal drainage, (1) motile amebas (Figs. 3 and 4), encysted amebas (Fig. 5), and moribund amebas (Fig. 6).

The motile amebas have been preserved with pseudopodia still extended (Fig. 3 *C*, *D*, *E*, *F*), with ingested leukocytes (Fig. 3 *A*) and erythrocytes (Fig. 3 *B*) in their cytoplasm, and with bacteria (Fig. 3 *E* and *F*) in vacuoles. These evidences are indicative of the presence of a normal motile feeding phase in the region from which the duodenal drainage is derived.

The cysts of *Endameba dysenteriae* were found in the duodenal drainage of Patient 50 two years after specific therapy, and four months after removal of the appendix and digital examination of an apparently normal gallbladder. The cysts occurred in Flask 4 only. They were few and appeared to be normal in cytologic detail. Two of them (Fig. 5 *A* and *B*) contained characteristic glycogen vacuoles. One (Fig. 5 *C*) had the characteristic terminal remnants of the chromatoid bodies. This is significantly a four nucleate cyst. Cysts in the one, two and four nucleated stages have been found, but those with one nucleus were most frequently seen. The three cysts shown in Figure 5 all came from Case 50 and exhibit a considerable range in diameter, being 14, 5 and 7 microns, respectively. This suggests the occurrence of both large and small amebas, a condition sometimes seen in amebas from active ulcers and in our cultures in vitro.

Moribund amebas from the duodenal drainages of three different patients (18, 28 and 50) are shown in Figure 6. They intergrade with the normal motile amebas. They exhibit varying degrees of loss of chromatin from the nucleus, disappearance of the spoke radii and karyosome, a tendency to vacuolation of the cytoplasm and a general lack of stainability. It is probable that Figure 3 *G* and *H* represents early stages in this process. The cause of this condition is unknown. Similar amebas are sometimes found in stools and in our cultures in vitro. It is possible that the bile with which they have been in contact may be deleterious to them.

According to the work of Kofoid and Wagener,[4] a 1 : 10 dilution of human or cat bile will cause lysis within from twenty to thirty minutes in *Endameba dysenteriae* from our cultures in vitro on the slide, treated with petrolatum, on the warm stage. This strength inhibits the growth of the ameba when added to the mediums used in vitro. Conditions in vitro are not those of the liver region. The remarkable powers of acclimatization exhibited by certain protozoa to toxic substances should be remembered in this connection. It is quite possible that amebas transported to the liver might become in time acclimatized to a much higher concentration of bile than are culture amebas derived from discharges of ulcers of the colon and suddenly exposed to bile.

The presence of the moribund amebas in the duodenal drainage may, in the light of our experiments, indicate a progressively destructive action of the bile on them. It may thus be that the gallbladder region in a case of amebic hepatitis is one into which the contents of amebic cytoplasm are released to a greater or less extent, whenever the amebas escape from the liver by way of the biliary system.

It is apparent, however, that not all of them are thus destroyed, for seemingly normal motile amebas escape in the duodenal drainage, and some of them have assumed the cystic condition before they reach the fixing fluid of the duodenal flask. Kofoid and Wagener[4] have been unable, however, to induce encystment in vitro in culture amebas by forty-eight hours' exposure to varying dilutions of bile.

The evidence for concluding that the amebas of the duodenal drainage are derived from the liver area is

4. Kofoid and Wagener: To be published.

as follows: (1) the clinical signs in the hepatic area; (2) the coincidence of regression with amebas in the duodenal content, following treatment; (3) the inclusion of amebas (Fig. 4) together with typical gall-bladder débris in mucous strands; (4) the increased facility in finding amebas in stools following the administration of bile salts, and (5) the absence of any evidence from clinical examination or necropsy, of infection of the jejunum or ileum, above its lowermost part, by *Endameba dysenteriae*. Amebic hepatitis may, therefore, be hematogenous in origin and attend many, perhaps all, cases of chronic amebiasis.

"SPECIFIC" THERAPY

The term specific therapy in our papers refers to the use in combination of emetin hydrochlorid and either emetin periodid or rarely bismuth emetin iodid plus either neo-arsphenamin or stovarsol. In addition, under this term are included also bismuth subnitrate and an organic iodin preparation (iodo-oxybenzenepyridin sulphonate). The use of these medicinal agents in our hands, with emphasis on such precautions as are observed regularly against both overdosage and insufficient medication, will be discussed in a subsequent paper.

Combinations of the above mentioned drugs are used because each has been tested singly and the results obtained are inferior to those resulting from their combined use.

A word of caution should be said regarding the necessity of keeping a very close supervision of the patient during specific therapy, in which period all symptoms are generally exacerbated, and even more especially, of being watchful during the post-treatment period. Persons with amebiasis are often subject to profound depression, mentally and physically, are prone to circulatory disturbances, such as palpitation and mild tachycardia, and often emerge from a bout with specific medication with definite secondary anemia. Commonly, patients have a troublesome colitis, which is often accompanied by hemorrhoids. It is obvious that all patients must be followed till normal.

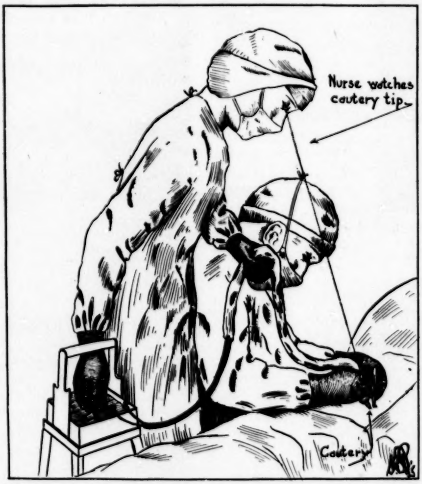

Fig. 1.—The nurse standing on a tall stool, watches the cautery tip in the hand of the operator, and controls the heat by means of the rheostat mounted on a stand.

Relation of Social Service to Other Social Agencies.—Social work in dispensaries is a form of treatment that may include a variety of activities. Its chief aim is to speed up the processes that make for the patient's recovery. The social worker may herself carry out the necessary steps in removing obstacles and in making adjustments or she may act as intermediary between the patient and the agency especially qualified to carry out this procedure. Because of the variety of tasks that fall to her lot, she needs to maintain a nice balance between the work that is peculiarly hers and that which should be delegated to other agencies.—*Hosp. Social Service* **12**:137 (Sept.) 1925.

GLANDULAR BLOCK DISSECTIONS FOR METASTATIC CANCER

REPORT OF ONE HUNDRED AND SIXTY CASES DONE EXCLUSIVELY WITH THE CAUTERY *

A. C. SCOTT, SR., M.D.
TEMPLE, TEXAS

It is my purpose, not to review the history of cancer or of the cautery, but first to point out that surgery or surgical technic has not reached its maximum efficiency in the treatment of cancer and later to show that the cautery as a therapeutic agent has undreamed of possibilities.

Until the cause of cancer is positively known, no one will be justified in believing that surgery will be of any real value beyond certain local and regional limitations.

According to Crile's [1] investigation of 4,500 necropsies on subjects who had had cancer of the head, face and neck, in which 99 per cent. had no metastasis below the base of the neck, one must conclude that the fatal results of those dying from cancer in this group were attributable to extension of the original growth by local infiltration of important tissues adjacent to it and to neck metastasis only, and one cannot escape the further conclusion that, in the cases in which operations were performed, the operation stopped short of completion, failing to include some of the growth, infiltrated tissues or metastasized glands, or that the wound was contaminated with live cancer cells during the operation.

In 1921, Sistrunk [2] reported a series of cases, with no metastasis at the time of operation, which showed 10.5 per cent. local recurrence of the disease. He also reported that in forty-six cases of local recurrences 80.4 per cent. showed involvement of the lymph glands at the time of operation.

When one considers that during the excision of cancerous masses and during glandular block dissections it is difficult to avoid cutting into infiltrated tissues near the growth or into infected lymph chains or glands before completion of the operation, thus contaminating the knife, scissors or gauze sponges with live cancer cells, and when one further considers the numerous open lymph chains and capillary blood vessels exposed

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Crile, G. W.: Excision of Cancer of the Head and Neck, with Special Reference to the Plan of Dissections Based on One Hundred and Thirty-Two Operations, J. A. M. A. **47**: 1780 (Dec. 1) 1906.

2. Sistrunk, W. E., and MacCarty, W. C.: Life Expectancy Following Radical Amputation for Carcinoma of the Breast: A Clinical and Pathologic Study of Two Hundred and Eighteen Cases, Ann. Surg. **75**: 61 (Jan.) 1922.

to such contamination, it is not at all strange that local recurrences following surgical operations on patients of proved susceptibility are still quite common.

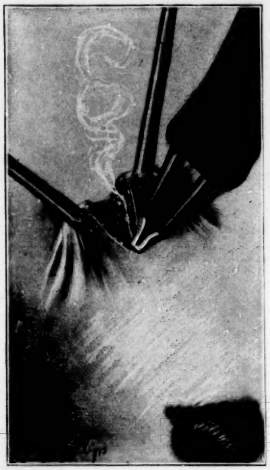

Fig. 2.—Beginning skin incision: Holding the skin on tension is one essential for a successful cautery incision.

It is not conceivable that a red hot cautery which might touch cancer cells during a surgical procedure could possibly be the means of spreading such cells into tissues through which it passed, and it could hardly be doubted that the cautery closes lymph and capillary blood vessels the instant it touches them.

It should be made clear just here that the cauterization of cancer as practiced by the ancients with heated blunt instruments and popularized in recent times by the use of the soldering irons, and various instruments heated by electricity, in the hands of John Byrne, Percy, Bloodgood, Ochsner and others, is distinctly different from the use of the beveled edge cautery heated especially to suit various tissues involved and used like a knife for radical excision of cancerous masses, the reflection of skin flaps and block dissections. While the former may be used for making excisions, it destroys tissues in mass and leaves great areas of charred tissue, the operators depending on heat radiation for varying and uncertain distances into apparently healthy tissue in the blind hope that it may reach any cancer cells that may have escaped destruction with the deeply charred tissues.

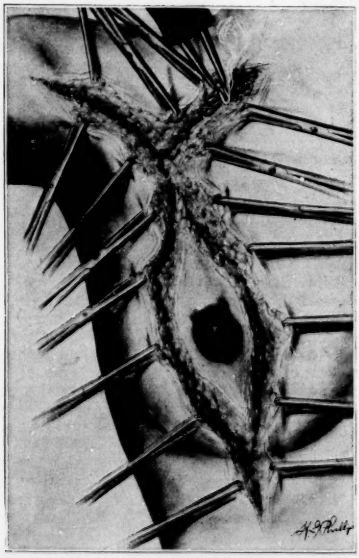

Fig. 3.—Completion of skin incision and beginning of flap dissection.

In 1920, I [3] described much of the technic here given, showing the possibility of making skin incisions and flap reflections with the cautery in a manner to secure primary union of wounds. I also showed the possibility of removing lymph gland bearing tissues from accessible areas by dissection with the cautery alone.

Space forbids giving the details of the technic in full. It is sufficient to say that the entire operation is done with the bevel edge cautery as the instrument of incision and dissection, and that observance of certain principles are absolutely essential for success. They are as follows:

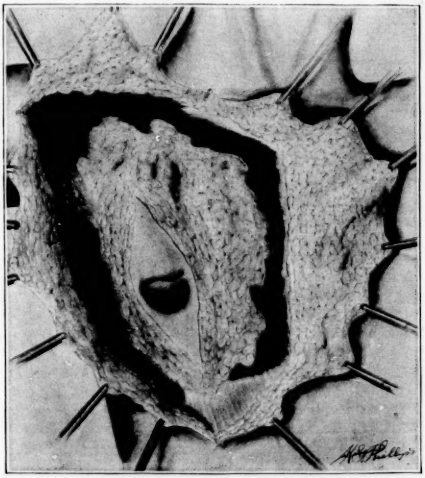

Fig. 4.—Skin flaps completed, ready for amputation, which includes pectoralis major muscle.

1. All tissues must be held on tension as the cautery approaches them; i. e., perfect retraction is absolutely essential.

2. The cautery must be applied in strokes that are short and quick.

3. Perfect control of the cautery heat is best attained by a trained assistant who has no other duty to perform.

4. The cautery must be heated to suit the different tissues involved.

5. Three distinct differences in heat are essential:

(*a*) White heat for incising skin when primary union of skin is desired and for cutting large sensory nerves.

(*b*) Bright cherry red for reflecting skin flaps, cutting muscles and for dissections in general.

(*c*) Dark red for working close to large blood vessels and nerve trunks. With this low degree of heat the cautery tip

3. Scott, A. C.: Radical Excision and Sterilization of Certain Local and Glandular Infections, Texas State J. Med. **16**: 250 (Oct.) 1920.

may safely pass within one-sixteenth inch of a large vessel, loosening the areolar attachment of its sheath without damage to its wall.

The three and five year tests for cure of cancer are unquestionably valuable in determining the actual results that follow operation for cancer, but they do not determine with accuracy the real value of the technic employed. Their greatest significance probably relates to the degree of malignancy, to the period of the disease, and to the state of metastasis existing at the time operation was performed.

In attempting to arrive at the merit of an operation, it is obvious that, if performed after metastasis has advanced beyond the field of operation, no surgical procedure will have any value so far as the final outcome is concerned.

We should, then, keep clearly in mind that the most perfect technic will fail in almost every case if metastasis has progressed beyond the field of operation prior to the time of operation. Regardless, then, of how

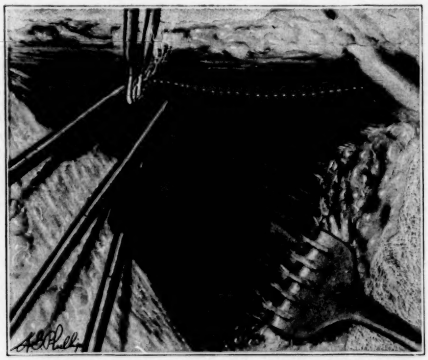

Fig. 5.—Pectoralis major muscle being severed and excised with breast.

good the technic may be, the surgeon's three and five year cures may show a high or low percentage of mortality, according to how careful he has been in eliminating cases that have progressed beyond hope of improvement

Most local recurrences are within the three year limit and most of the reported deaths after the three year limit are due to remote metastases, which evidently existed at the time of operation. In our own cases, all the local recurrences appeared in less than one year after operation, the average time being five months.

With these facts in mind and also remembering that most local recurrences are found within three years, it seems to me only rational to return to Volkmann's period of three years to determine, *not* the percentage of final cures, but rather the value of the surgical technic used in the elimination of the local disease and accessible metastasized glands.

Since patients suffering from cancer come for operation at a time when we have no means of ascertaining the limits of metastasis and no power to check metastasis beyond the first group of glands, it occurs to me that the statistical calculations which are designed to determine the value of any procedure should lay greatest emphasis on local recurrences to determine two things: 1. Thoroughness of technic in eradicating the local lesion and the accessible lymph nodes most likely to be involved. 2. The ability of the operator to remove all demonstrable lesions, and include tissues

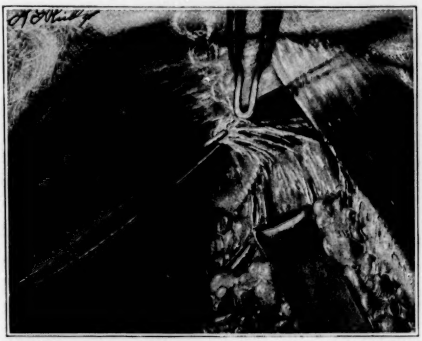

Fig. 6.—Exposure of axillary vessels by removal of fascia below margins of pectoralis minor and coracobrachialis.

most likely to be invaded by disease, without leaving the wound contaminated with cancer cells, set free by cutting into infected areas or tearing through infected lymph nodes or chains.

Therefore, I believe that the most uniform test of a therapeutic agent should be the freedom from recurrence in or about the site of operation for a period of three years.

LOCAL RECURRENCES

In this series of 145 patients traced, there were five local recurrences in or near the site of operation. Considering only seventy-eight patients operated on three

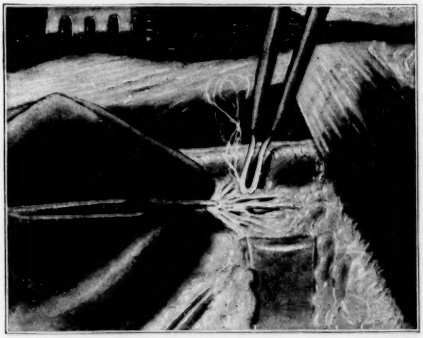

Fig. 7.—Easy separation of fascia from vessels by means of tension on axillary fascia, with light touches of dark red cautery.

years or longer, we have local recurrences of 6.4 per cent. Three of these with local recurrences would ordinarily have been considered inoperable on account of extensive infiltration and probably should not have been operated on. If these cases were not counted, the percentage of local recurrences would be 2.3.

There was not a single local recurrence in the group of thirty breast cases operated on three years or longer. As a matter of fact, up to this time there have been no local recurrences in any of the sixty-five breast cases.

The 160 cases referred to in the title of this paper were drawn from more than 700 cases of cancer in

Fig. 8.—Cutting of pectoralis minor with cautery above vessels while it is being lifted with the finger.

TABLE 1.—*One Hundred and Forty-Eight Cautery Glandular Dissections for Metastatic Cancer*

Analysis of Cases

Location of Original Tumor	Site of Glandular Dissection	Pathologic Examination Showed Glands			Operative	
		Patients	Involved	Not Involved	Not Traced	Deaths	Mortality, per Cent.
Breast	Axilla	65	38	27	1	1	1.5
Tongue	Neck	6	6	..	..	1	16.6
Mouth	Neck	6	6	..	..	0	....
Lip	Neck	13	10	3	1	0	....
Parotid	Neck	5	4	1	..	0	....
Skin of scalp	Neck occipital triangle	1	1	..	..	0	....
Ear	Neck	5	5	..	..	0	....
Face	Neck	15	9	6	..	1	6.6
Neck	Neck	11	8	3	..	1	9.1
Extremities	Axilla and epitrochlear	7	7	..	..	0	....
Genitals	Groin	8	8	..	..	0	....
Glands (Original site unknown)	Axilla	4	4	..	..	0	....
	Neck	1	1	..	..	0	....
	Groin	1	1	..	1	0	....
		148	108	40	3	4	2.7

TABLE 2.—*Condition in Cautery Gland Dissections, All Types, Three Years or Longer After Operation*

	Operated On	Local Recurrence	Died from Distant Metastasis	Died from Other Causes	Well	Percentage of 3 Year Cures
Patients.....	78	5	20	6 (4 operative)	52	66.6
Glands involved...	62	5	20	6 (4 operative)	36	58+
No glands involved	16	0	0	0	16	100

TABLE 3.—*Condition in Cautery Gland Dissections for Cancer of Breast, Three Years or Longer After Operation*

	Operated On	Local Recurrence	Died from Distant Metastasis	Died from Other Causes	Well	Percentage of 3 Year Cures
Patients.....	30	0	8	1 cerebral embolus	21	70
Glands involved...	18	0	8	1 cerebral embolus	9	50
No glands involved	12	0	0	0	12	100
Five Years or Longer						
Patients.....	11	0	3	0	8	72.7
Glands involved...	5	0	3	0	2	40
No glands involved	6	0	0	0	6	100

TABLE 4.—*Summary of Breast Cancer*

	Three Year Cures, per Cent.	Five Year Cures, per Cent.
Jacobson: Ohio State M. J. **14**: 639, 1818.....	32.8*	23.7*
Handley: Brit. M. J. **1**: 37 (Jan. 8) 1921.....	48	....
Buchanan: Pennsylvania M. J., 1918, p. 623.....	38	23.5
Lee, B. J.: Am. J. Roentgenol., December, 1924, p. 535	....	15
Sistrunk: Ann. Surg. **65**: 63, 1922.....	51.8	39
Scott	70	72.7

* In review of literature, 1,806 traced cases.

which the cautery was used for excision. Twelve of them will be disregarded in this report because of incomplete pathologic reports and because part of them

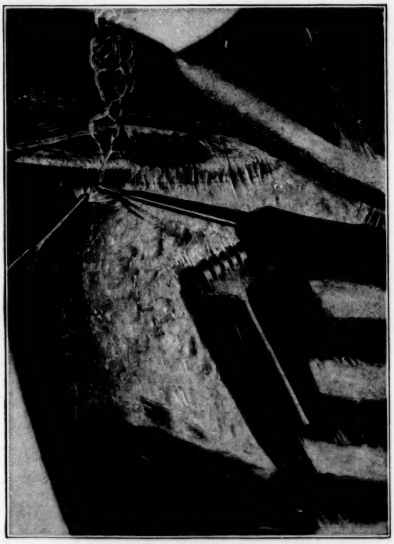

Fig. 9.—With pectoralis minor turned down, fascia covering vessels is gently placed on tension and loosened by light touches of cautery.

were not done with the cautery alone. We are concerned with the 160 cases only because of the operative mortality, which consisted of four cases, representing 2.5 per cent. There were 148 cases which have complete pathologic reports and were done with the cautery alone, distributed as shown in the accompanying tables.

CONCLUSIONS

1. Block dissection of the neck, axilla and groin for metastatic cancer can be done with an electrically heated bevel edged cautery with the following results:

(*a*) Marked reduction in the amount of blood lost during the operation.

(*b*) Marked decrease in postoperative pain.

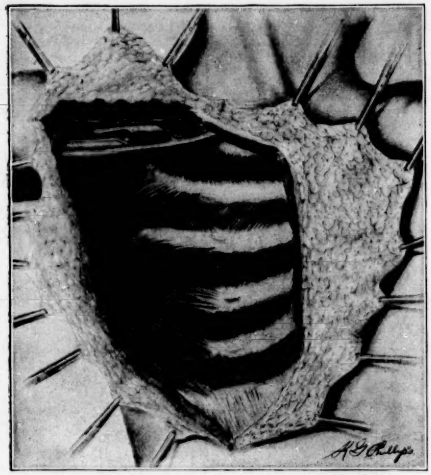

Fig. 10.—After completion of dissection, wound is ready for closure.

(*c*) Marked decrease in the number of patients showing any operative shock whatever.

(*d*) Primary union of skin flaps.

2. Operations done with the technic described, as compared with cauterization as commonly practiced, result in less pain, less shock and much shorter convalescence.

3. Operations done by this method, as compared with operations done with the knife, scissors or gauze dissection method result in:

(*a*) Fewer local recurrences in or near the site of operation, and therefore:

(*b*) A greater percentage of three and five year cures.

4. Since the groups of cases here reported contain many that would ordinarily fall in the inoperable group, I feel justified in believing that if this type of technic should be used in only the operable group, the percentage of three and five year cures would be still further increased.

ABSTRACT OF DISCUSSION

DR. FRANK E. ADAIR, New York: Any new method of surgically attacking breast cancer is valuable. There are so many types and clinical manifestations of the disease, each differing so vastly, that a routine surgical removal is not always the best method for a particular patient. Dr. Scott not only gives us a new method, but a complete series of traced cases treated by a method not heretofore employed. Why his percentage of five-year cures in cases having axillary involvement runs so high, I am at a loss to explain. I see no reason why those cases should have a better opportunity for cure with the cautery than with a painstaking dissection with scalpel or scissors. As a matter of fact, a microscopic study of the tissues remaining behind, treated by Dr. Scott's method, will show a very narrow zone of heat coagulation necrosis where touched by the cautery; outside this is a zone of small, mononuclear infiltration of mild degree. The tissue reaction is not intense. This is to be anticipated, because part of Dr. Scott's technic is to have the assistant forcefully retract the tissues in such a way that the cautery comes in contact with a particular portion of tissue for only a fraction of a second; otherwise, there would not be primary union. Dr. Scott has emphasized a new point of great importance to surgeons; namely, the application of the Lane technic principle to cancer surgery. I believe he is correct in making it the rule never to put into the wound a gauze sponge that he has been using before; this is particularly important when operating in an axilla that obviously is involved. Unquestionably, many cancer transplants are due to not observing this principle. After all, many factors enter into breast surgery, such as the age of the patient, the type of carcinoma, lactation, rapidity of growth and distribution of the disease; these factors are, to a large extent, those that will eventually determine the future result of a particular case. Unfortunately, to cope with these factors is entirely beyond the power of the surgeon.

DR. J. F. PERCY, Los Angeles: On the basis of results, Dr. Scott's paper is ideal. I believe that he could improve them still further if he made use of a knife of greater bulk. This would insure an even flow of a more penetrating degree of heat, something that cannot easily be accomplished with the type of cautery knife shown. A knife that will give a constant and adequate degree of temperature, regardless of how wet or how dry the tissues may be, can be regulated to a nicety, especially about the blood vessels. This cannot be true of the thin platinum blades that are sold for cautery purposes. A knife that has bulk will feed heat into the tissues and thus destroy more cancer cells with less damage to normal cells than can the knife without bulk. One cannot get heat penetration with the short, quick strokes spoken of by Dr. Scott. But with a larger knife, in which the heat is more easily regulated, fat can safely be melted on the surface of the carotid artery or jugular vein. The cancer cell is quickly destroyed by a temperature that will melt fat. With a sufficient and steady flow of heat, the outer coat of the carotid artery with its sympathetic nerve fibers can be dissected free, without permanent damage to the underlying vessel structures. I want to

Fig. 11.—Primary union may be obtained in most cases.

take exception to a statement made by Dr. Adair that in cases in which metastasis develops we cannot hope for any results from further treatment. If the metastatic focus is accessible and is treated as actively as was the primary condition, a surprising number of these otherwise doomed patients will remain well for years. We have too many preconceived ideas regarding cancer that are not true clinically. Many of them have come down to the present time merely as traditional lore from the fathers of medicine. The appearance of a mass of cancer, great or small, ulcerating or intact, primary or metastatic, gives absolutely no clue as to the degree of either its malignancy or benignity. Untreated, patients practically all die. But if managed along modern lines, a large percentage will make a good recovery, as has so well been pointed out in the paper that we have just heard.

SPIROCHETAL PULMONARY GANGRENE TREATED WITH ARSPHENAMINS *

B. S. KLINE, M.D.
AND
S. S. BERGER, M.D.
CLEVELAND

In a previous article,[1] it was stated that "evidence is accumulating that pulmonary gangrene may be caused by spirochetes and fusiform bacilli aspirated from an unclean mouth, and that it may be prevented by proper oral hygienic measures. Furthermore, when the condition is once established a diagnosis can be made early by finding the organisms in the washed sputum, thus offering an opportunity for successful specific treatment with the arsphenamins."

The etiologic relationship of spirochetes and fusiform bacilli to pulmonary gangrene is evidenced not only by the predominance of these organisms in early gangrenous areas but also by the fact that gangrene with death in a few days was produced in guinea-pigs [2] by the injection into traumatized tissues of material from pyorrhea alveolaris, dental caries, pulmonary gangrene and Vincent's angina containing innumerable Vincent spirochetes and fusiform bacilli. The organisms in the material from four cases of Vincent's angina that produced gangrene in guinea-pigs were almost solely the characteristic spirochetes and fusiform bacilli.

The relationship of oral spirochetosis to pulmonary gangrene is emphasized by the production in a rabbit of pleuropulmonary gangrene following the intrabronchial injection of material from dental caries containing innumerable Vincent spirochetes and fusiform bacilli.

Many cases of bronchopulmonary spirochetosis have been reported from Europe and the tropics since the publications of Rona (Hungary, 1905) and Castellani (India, 1906), but in the United States, including sixteen cases observed during the course of the last two years at Mount Sinai Hospital, Cleveland, only fifty-two cases [3] of this condition have been reported. Some of these fifty-two cases were at first confused with tuberculosis, abscess, bronchopneumonia or lobar pneumonia. The disease was observed somewhat more frequently in males, the patients ranging in age from 4 to 76 years. The sputum in some of these cases was jelly-like and blood tinged, in some frankly hemorrhagic, in some purulent and in others thin, brown and foul smelling. In only two of these cases did the washed sputum show tubercle bacilli. It always contained, however, numerous spirochetes varying considerably in morphology, frequently associated with fusiform bacilli.

CASES OBSERVED AT MOUNT SINAI HOSPITAL

CASE 1.—W. R., a man, aged 30, a physician, admitted, March 1, 1924, had not felt well for some time. For the past two weeks he had been coughing and expectorating incessantly and he had substernal pain and an afternoon rise in temperature. In August, 1921, he had Vincent's angina, which apparently cleared up after several injections of neo-arsphenamin.

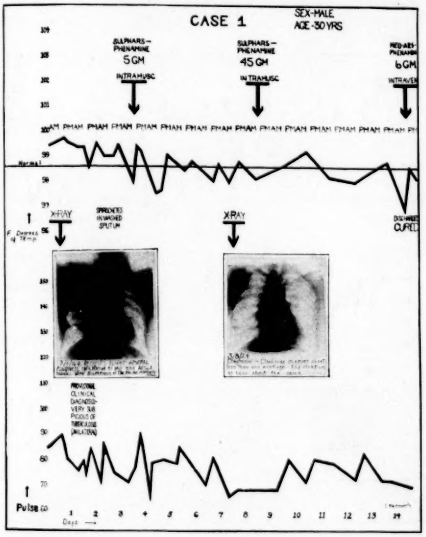

Fig. 1 (Case 1).—Course of temperature and pulse.

The examination showed a patient with asthenic habitus and a general appearance suggestive of tuberculosis. There was slight lateral curvature of the spine. There was some impairment posteriorly in the right upper chest.

March 1, the leukocytes numbered 7,200. The examination of the sputum (yellowish, purulent) was negative for tubercle bacilli. The roentgen-ray diagnosis was "very suggestive of tuberculosis of the right base and infraclavicular region."

March 3, the sputum (well washed) showed no acid-fast bacilli. Many spirochetes of Vincent type were found in Fontana stained slides. This finding, with the history of Vincent's infection in the mouth, decided us, March 4, to give 0.5 gm. of sulpharsphenamin intramuscularly.

March 8, the sputum (after treatment) showed fewer spirochetes than on March 3. The roentgen-ray examination revealed slight mottling at the base and cloudiness in the upper right chest. This was much less than on the previous examination.

March 9, 0.45 gm. of sulpharsphenamin was given intramuscularly.

* From the Departments of Pathology and of Medicine of Mount Sinai Hospital.
* Read before the Section on Practice of Medicine at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Kline, B. S., and Blankenhorn, M. A.: Spirochetal Pulmonary Gangrene, J. A. M. A. **81**: 719 (Sept. 1) 1923.
2. Kline, B. S.: J. Infect. Dis. **32**: 481 (June) 1923.
3. Kline and Blankenhorn (Footnote 1), twenty-four cases. Observed at Mount Sinai Hospital, Cleveland, and reported here, sixteen cases. Greeley, H.: Am. J. M. Sc. **155**: 742 (May) 1918, three cases. Pilot, I.; Davis, D. J., and Shapiro, I. J.: Am. Rev. Tuberc. **8**: 249 (Nov.) 1923, five cases. Rawson, Vance: Spirochetal Abscesses of the Lung, J. A. M. A. **82**: 545 (Feb. 16) 1924, one case. McNeill, C.: Bull. Johns Hopkins Hosp. **35**: 368 (Nov.) 1924, one case. Jaekson, Chevalier: Ulcerative Bronchitis Due to Vincent's Organisms, J. A. M. A. **83**: 1845 (Dec. 6) 1924, two cases.

March 14, the roentgen-ray examination, after two injections of sulpharsphenamin, showed that practically all infiltration had disappeared.

All signs and symptoms rapidly disappeared. The temperature and pulse reached normal. The cough and expectoration ceased. The patient was discharged free from all symptoms, March 15, two weeks after admission.

CASE 2.—J. A., a man, aged 29, a patient of Dr. Harold Feil, admitted, July 28, 1924, six days before admission began having fever, headache, cough and some pain in the chest. He was apathetic, cyanotic and acutely ill. The temperature was 100.2 F.; the pulse, 115, and the respirations, 30. The patient coughed frequently, bringing up abundant purulent sputum. The teeth showed several fillings and crowns. There were signs of consolidation of the lungs at both bases, more marked over the right base. Crepitant râles were present. Anteriorly there were signs of diffuse bronchitis. The clinical impression was diffuse bronchitis and bronchopneumonia.

July 28, the leukocytes numbered 15,000. The roentgen-ray examination showed moderate thickening of the hilum and marked fine and coarse mottling throughout the right side of the chest. In the left side of the chest there were several small areas of increased density throughout; also some fine mottling, less marked than on the right side.

July 29, the sputum showed no tubercle bacilli. There were a moderate number of Vincent spirochetes and fusiform bacilli present.

July 31, the leukocytes totaled 16,200.

From July 29 to August 6, daily sputum examination showed no tubercle bacilli.

August 2, the patient received 0.4 gm. of neo-arsphenamin intravenously. The following day he was much improved. The temperature was normal; the coughing and expectoration were diminished.

August 6, the patient was given 0.6 gm. of neo-arsphenamin intravenously and discharged from the hospital, greatly improved.

Beginning August 8, the patient was given four weekly intravenous injections of neo-arsphenamin followed by complete recovery. He has been working since.

May 5, 1925, the roentgen-ray examination showed the lungs to be clear.

CASE 3.—O. F., a man, aged 58, on admission, Feb. 1, 1924, stated that he had bronchitis for seven years with moderate cough. A week before, he developed fever and was obliged to remain in bed. The night before admission, after a severe coughing spell, he noticed that the sputum was bloody. February 1, following a coughing spell, a large amount of bright red blood gushed from his mouth. He was brought to the emergency room and admitted to the hospital.

The examination revealed a dark cherry hue to the patient's lips, marked oral sepsis, marked general arteriosclerosis, and barrel chest with signs of chronic bronchitis and emphysema. The blood pressure was: systolic, 138; diastolic, 80. The spleen was felt about a hand's breadth below the costal border, the edge firm, smooth and not tender. The liver was palpable, the edge firm, not tender. The reflexes were normal.

The clinical diagnosis was emphysema; chronic bronchitis; Vincent infection of mouth and lung; polycythemia vera.

November 3, the roentgen-ray examination showed generalized peribronchial thickening, slight mottling of the infraclavicular areas, and moderate infiltration at the left base.

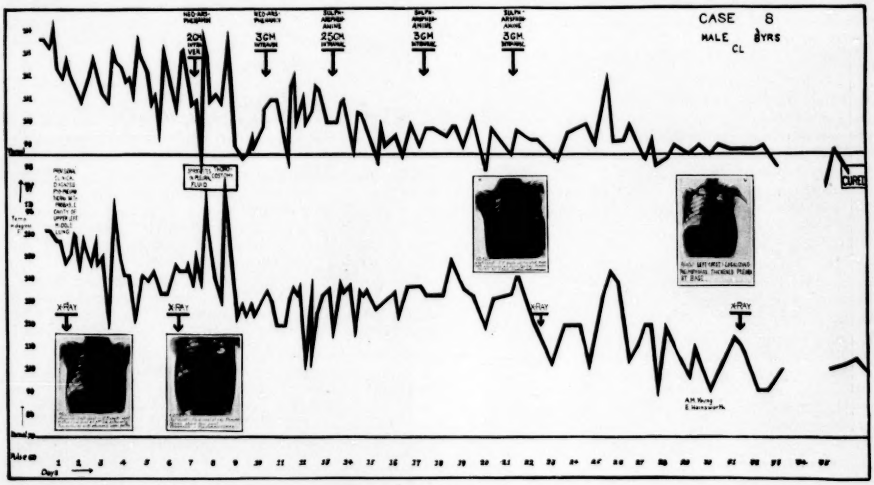

Fig. 2 (Case 2).—Course of temperature and pulse.

The red blood count ranged from 7,100,000 to 13,500,000; the leukocytes, from 16,800 to 24,000. The hemoglobin was 130 per cent. The blood Wassermann reaction was negative. Daily examinations of the sputum were negative for tubercle bacilli. Numerous fusiform bacilli and spirochetes were found in direct smears from the mouth and also on three occasions from the washed sputum.

November 7, 0.3 gm., and November 10 and 13, 0.4 gm. of sulpharsphenamin was given intramuscularly. The acute pulmonary condition cleared up completely. Phenylhydrazin was given for the Vaquez disease until the red blood count was down to about 5,000,000. Since then the patient has been receiving it intermittently when his blood count rises.

The patient was discharged, improved, November 13.

December 2, he received 0.4 gm. of sulpharsphenamin intramuscularly.

May 5, 1925, roentgen-ray examination showed generalized peribronchial thickening but no infiltration.

CASE 4.—V. C., a man, aged 29, who came to the dispensary, March 28, 1924, stated that he began to have rheumatism with painful and swollen joints while in the army. Since his discharge in 1919, he had not felt well because of recurring

attacks of rheumatic pains. For the last two years he had been spitting blood every morning. Eight months before coming, he was treated for rheumatism at the Marine Hospital.

The examination revealed signs and symptoms suggesting tuberculosis of both upper lobes, with activity in the left upper lobe. During an examination in the ear, nose and throat department, blood was seen coming from the trachea.

March 29, the roentgen-ray examination was suggestive of tuberculosis of the upper part of the chest on both sides.

April 10, the sputum showed many fusiform bacilli and spirochetes of Vincent's and the macrodentium type.

April 11, the sputum (washed) was negative for tubercle bacilli. It showed innumerable Vincent spirochetes.

April 30, 0.2 gm. of arsphenamin, and May 14, 0.5 gm. of arsphenamin were given intravenously.

May 22, the sputum was negative for tubercle bacilli.

May 28, the sputum still showed Vincent organisms. The patient was given 0.5 gm. of arsphenamin intravenously. The patient felt much better. All joint pains had disappeared.

June 4, neo-arsphenamin, 0.5 gm., was given intravenously.

June 11, sulpharsphenamin, 0.5 gm., was given intramuscularly. The patient, much improved, did not return for further treatment.

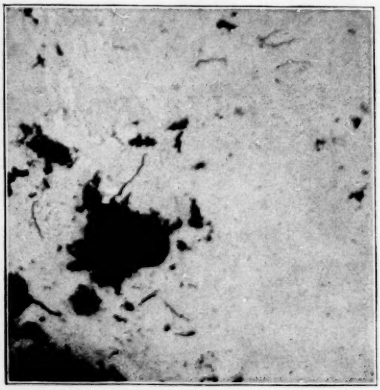

Fig. 3 (Case 8).—Carious tooth: spirochetes (Vincent and macrodentium types).

CASE 5.—L. G., a man, aged 55, admitted, Nov. 26, 1924, had a cold a year before admission which never cleared up. About two weeks before admission, he noticed blood in the sputum. He had been short of breath for a long time and had had cough and precordial distress. There had been some loss of weight.

On examination, the patient appeared cachectic, apparently quite ill and markedly prostrated. There was icteroid discoloration of the skin and conjunctivae. The lips were cyanotic. There was marked oral sepsis. The fingers were clubbed. Marked generalized arteriosclerosis was noted. There was flattening of the left side of the chest, with diminished respiratory excursions in the upper part. The breath sounds and fremitus were absent. Similar physical signs were made out posteriorly over the left apex. They were much more marked anteriorly. A soft systolic murmur, probably inorganic, was heard over the apex and the base of the heart. The liver and spleen were palpable. The clinical diagnosis was lung abscess.

The appearance of the mouth and the characteristic foul odor of the sputum suggested the possibility of spirochetal infection of the lung. Smears from the mouth and the washed sputum, November 26 to November 30, showed the presence of a few Vincent spirochetes. On the latter date, 0.45 gm. of neo-arsphenamin was given intravenously.

November 28, the blood Wassermann reaction was four plus.

Repeated sputum examinations showed the presence of fusiform bacilli until December 18. December 6, 12 and 18, the patient was given 0.6 gm. of neo-arsphenamin intravenously.

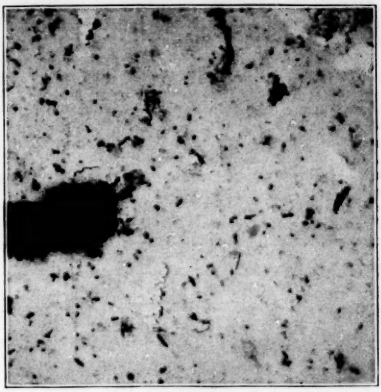

Fig. 4 (Case 8).—Washed sputum: Vincent spirochetes.

Some improvement was shown. The temperature gradually came down, but there was a slight daily elevation, apparently due to the presence of a tuberculous infection. The tubercle bacilli were found in the sputum, December 30. As the patient required additional observation and care, he was sent to the City Hospital.

CASE 6.—W. P., a man, aged 27, admitted, Sept. 9, 1924, had been confined in a Chicago hospital five months before, with a condition diagnosed pneumonia of the left upper lobe. At the end of three weeks he was discharged with a diagnosis

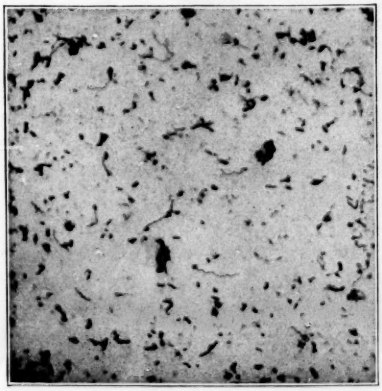

Fig. 5 (Case 8).—Pleural fluid: Vincent spirochetes.

of unresolved pneumonia. He later went to New York, where a diagnosis of pulmonary abscess was made. The patient's mother died from tuberculosis. One sister had tuberculosis.

The patient had marked oral sepsis. He coughed and expectorated large quantities of foul smelling sputum. Slight clubbing of the fingers was noted. There were signs of

thickened pleura, with some infiltration and cavity formation of the left upper lobe. The leukocytes numbered 14,000. The clinical diagnosis was pulmonary abscess of the left upper lobe. This was confirmed by the roentgen-ray examination, September 21.

The patient's temperature ranged between 99 and 103 F. Repeated daily sputum examinations were negative for tubercle bacilli. September 11, the sputum had a slightly foul odor and contained Vincent spirochetes and fusiform bacilli, and on the 12th, the patient received 0.4 gm. of sulpharsphenamin intramuscularly.

October 10, the patient had not improved appreciably since admission, so operation was decided on. A thoracostomy under local anesthesia was performed. The pleura was opened and a good sized pus pocket, well walled off with adhesions, was encountered. The lung abscess in the left upper lobe was drained. A smear of this material showed innumerable Vincent spirochetes and fusiform bacilli. October 15 and 18, the patient received 0.6 gm. of neo-arsphenamin intravenously. The temperature dropped to normal. The general condition improved markedly.

December 20, the sputum was brown and foul smelling. It was negative for tubercle bacilli.

December 24, the material draining from the thoracostomy wound contained a moderate number of fusiform bacilli and spirochetes of Vincent type.

December 26, in medical consultation, Dr. Berger recorded the following: "The finding of fusiform bacilli and spirochetes in the drainage from the thoracostomy wound should not go unheeded. It would be well, therefore, to give the patient neo-arsphenamin. The odor of the discharge from the wound is characteristic of gangrene."

December 27, 0.4 gm. of neo-arsphenamin, and Jan. 4, 1924, and January 10, 0.6 gm. of neo-arsphenamin was given intravenously.

January 1, the blood Wassermann reaction was plus-minus.

January 1, during the pleural irrigation, the patient stated that he could taste the surgical solution of chlorinated soda.

January 17, the roentgen-ray examination showed a large partial pneumothorax on the left side extending from the base along the axillary line to the apex. There was no evidence of fluid in the chest.

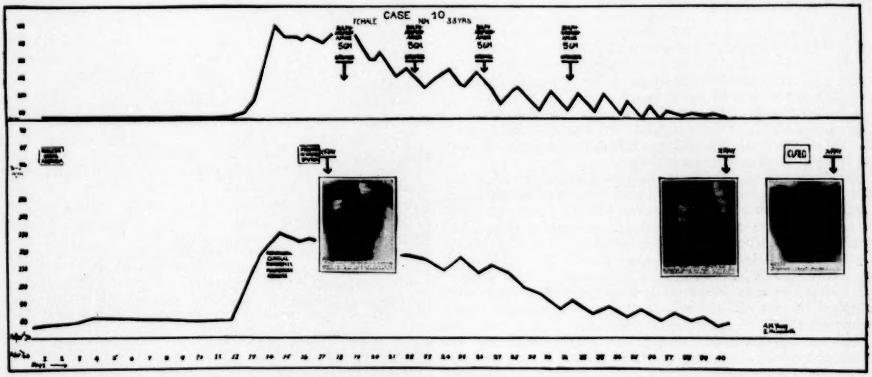

Fig. 6 (Case 10).—Course of temperature and pulse.

October 27, the wound was practically closed and there was only a small amount of drainage; 0.6 gm. of neo-arsphenamin was given intravenously.

November 3, the wound was entirely closed. There was no discharge. The examination of the chest showed practically normal signs except for sharpened breathing at the left upper lobe. All signs of infection had abated. There had been no elevation of temperature for ten days. Neo-arsphenamin, 0.6 gm., was given intravenously.

November 15, the patient was discharged, improved.

CASE 7.—H. D., a man, aged 32, admitted, Nov. 10, 1923, with a gunshot wound in the third left interspace 0.5 cm. above the left nipple, was critically ill. The point of exit was opposite the wound of entrance in the fifth interspace in the midscapular line posteriorly. There was evidence of a hemothorax of the left chest.

November 11, 600 c.c. of whole blood, uncitrated, was given intravenously.

November 12, the leukocytes numbered 11,000.

November 13, November 20 and December 8, thoracentesis was performed, and from 300 to 1,100 c.c. of thick, sanguineous fluid was obtained.

November 19, the sputum contained blood. It was negative for tubercle bacilli.

December 14, a resection of a portion of the ninth rib was performed. No fluid was encountered in the pleural cavity. Tubes were inserted, and the cavity was irrigated with surgical solution of chlorinated soda (Dakin solution).

February 3, the patient was discharged improved.

April 28, 1925, he had regained his weight and had returned to police duty. His mouth still contained spirochetes. The roentgen-ray examination of the lungs was negative except for thickened pleura on the left side.

CASE 8.—C. L., a boy, aged 8, referred by Dr. J. W. Epstein, admitted, April 21, 1925, with a diagnosis of pneumonia, began having pain on the left side with difficulty in breathing, cough and fever, five days before. He had a tonsillectomy under general anesthesia two weeks before admission.

The physical signs and symptoms on admission suggested lung abscess and open pyopneumothorax. The sputum was foul smelling. The leukocytes numbered 28,000. The patient's condition was very grave.

April 22, the roentgen-ray examination showed the costophrenic angle obliterated, a fluid level to the third rib anteriorly on the left side, and a pneumothorax above this point.

April 27, the roentgen-ray examination showed a fluid level at the third rib with a pneumothorax above this point. The diagnosis was pyopneumothorax on the left side. The sputum (washed) showed many Vincent spirochetes and fusiform bacilli.

April 28, a smear from a carious tooth showed numerous Vincent spirochetes and fusiform bacilli; 110 c.c. of foul smelling thin pus was obtained from the left side of the chest, a smear of which showed innumerable Vincent spirochetes and a moderate number of fusiform bacilli. The patient was given 0.2 gm. of neo-arsphenamin intravenously.

April 29, a thoracostomy was performed under local anesthesia on the left side. A large amount of foul smelling pus containing innumerable Vincent spirochetes was obtained. The washed sputum likewise contained many Vincent spirochetes and fusiform bacilli.

May 1, 0.3 gm. of neo-arsphenamin was given intravenously. The patient was still critically ill.

May 4, 0.25 gm. of neo-arsphenamin was given intravenously. The child was much improved. The discharge was still profuse but odorless.

May 8, 0.3 gm. of sulpharsphenamin was given intramuscularly. The child was practically well. The temperature and pulse were around the normal level.

Fig. 7 (Case 15).—Tooth caries (spirochetal).

May 12, 0.3 gm. of neo-arsphenamin was given intramuscularly.

May 13, the roentgen-ray examination showed the costophrenic angle obliterated on the left side, moderate cloudiness at the base, and a partial pneumothorax at the base to the third rib.

June 17, the patient was discharged cured.

Case 9.—L. J., a woman, aged 37, was admitted, Sept. 30, 1923, for a study of the genito-urinary tract. Tonsillectomy, adenoidectomy and teeth extraction were performed under general anesthesia, October 10.

The examination was essentially negative except for tenderness in the region of the left flank. The roentgen-ray examination of the teeth showed several abscesses. The tonsils were cryptic and greatly hypertrophied.

October 11, a rise in temperature was noted. October 13, the patient complained of pain in the right side of the chest and back. October 14, the patient had severe coughing spells and sweats, was restless, exhausted, delirious and refused nourishment. The respirations were short and gasping. October 15, the temperature reached 103 F. The leukocytes numbered 12,500. Seven days after operation, the patient expectorated a considerable amount of very offensive, blood-streaked sputum. The sputum examination was negative for tubercle bacilli.

October 26, the clinical diagnosis was lung abscess. The roentgen-ray examination was very suggestive of lung abscess at the right base.

The patient's condition steadily grew worse. There was expectoration of large quantities of foul smelling sputum, which directed a search for spirochetes, and they were recovered in large numbers from the washed sputum (November 16). The same day, the patient received neo-arsphenamin intravenously, and prompt improvement in all signs and symptoms was noted.

November 23, 0.6 gm. of neo-arsphenamin was given intravenously. The temperature, pulse and respirations gradually approached normal and the patient was discharged much improved, December 2 (seventeen days after the first antisyphilitic treatment).

April 28, 1925 (twenty months later), she was in good health. The roentgen-ray examination showed very slight cloudiness in the right upper chest, but otherwise was negative.

Case 10.—M. M., a woman, aged 33, a patient of Dr. Mahrer, was seen at home. She had had a tonsillectomy under general anesthesia, Sept. 2, 1924, with an apparently good recovery until September 13. On this day the patient became ill with a sharp pain in the right side with cough and fever. On the 15th, when seen in consultation, she showed well marked signs of infiltration of the right upper lobe. The temperature ranged up to 104 F. There was marked prostration. The sputum had a foul odor, of which the patient was conscious and complained. A tentative diagnosis of lung abscess following tonsillectomy was made. Because of the characteristic odor of the sputum, spirochetal infection was suspected and smears of the mouth and washed sputum were made, September 18, and showed numerous Vincent spirochetes and fusiform bacilli.

September 18, the roentgen-ray examination of the chest with a portable apparatus showed marked density in the upper right part of the chest, with a small cavity in the infraclavicular area.

Four intramuscular injections of sulpharsphenamin (each 0.5 gm.) were given at intervals of five days, beginning September 18. The patient made an uneventful recovery, and at the end of four weeks was able to leave her bed. The patient has been well since and is teaching school as before.

October 10, the roentgen-ray examination revealed much less density and infiltration of the right chest than on the first examination. The diagnosis was pulmonary abscess.

April 25, 1925, the roentgen-ray examination revealed that the chest was normal.

Case 11.—T. S., a man, aged 39, admitted, Nov. 26, 1924, had had pleurisy, and rheumatic fever with mitral valvulitis, in 1915. Later a mitral stenosis developed. In July, 1924, there was infarction of the kidney, with hematuria.

Two years before admission, the patient began having some pain in the chest, with difficulty in breathing, and since then had been incapacitated a good part of the time. About two weeks before admission, his condition became worse, with coughing and expectoration of yellowish, bloody sputum with some odor.

The examination showed signs of emphysema with chronic bronchitis and superimposed acute infection of the bronchi causing marked respiratory embarrassment. There was no evidence of cardiac failure.

November 26, a smear from the teeth showed a moderate number of fusiform bacilli. No spirochetes were seen.

November 27, the roentgen-ray examination of the right side of the chest showed the hilum enlarged, with much vascular congestion extending into the lung. There was cloudiness in the midportion of the lung. The left lung showed the diaphragm and the costophrenic angle slightly clouded. There was haziness of the entire lung from a thickened pleura. The orthodiagram showed a typical configuration of mitral stenosis. The leukocytes numbered 11,000. The blood Wassermann reaction was negative.

From November 27 to December 4, daily examinations of the washed sputum revealed the presence of a moderate

Fig. 8 (Case 15).—Spirochetal pulmonary gangrene.

number to innumerable Vincent spirochetes and fusiform bacilli. No tubercle bacilli were found.

Since the Vincent organisms were repeatedly recovered from the washed sputum, the condition was considered a spirochetosis superimposed on a chronic bronchitis. December 4, the patient received 0.6 gm. of neo-arsphenamin intravenously. The next day he left the hospital improved and did not return to the outpatient department for observation.

Case 12.—G. K., a man, aged 42, was admitted to the hospital, May 24, 1924, in a dying condition. His eyes were hollow

and sunken. The malar bones were prominent. He was stuporous. The respirations were rapid and shallow. There was coughing, with occasional expectoration of very foul smelling, greenish gray sputum. The mouth showed marked oral sepsis. The posterior pharyngeal wall was covered with a thick, foul, greenish, purulent discharge. The tonsils were moderately enlarged. The cervical glands were palpable, about the size of almonds. The chest showed signs of abscess of the right lung. The clinical impression was pulmonary abscess with gangrene.

May 25, the sputum contained numerous Vincent spirochetes; there were no tubercle bacilli. On this day and the 27th, the patient received 0.6 gm. of neo-arsphenamin intravenously. The temperature ranged from 100 to 103 F., the pulse from 120 to 140, the respirations from 30 to 60. Roentgen-ray examination (May 19, before admission to the hospital) showed a marked area of infiltration in the region of the middle lobe, with two distinct abscess cavities in the middle of this infiltration. There was slight mottling in the apex.

The patient died, May 28, four days after admission.

CASE 13.—J. S., a man, aged 29, overweight, with diabetes, admitted, March 1, 1925, complained of pain in the abdomen. There were signs of acute appendicitis. The leukocytes numbered 18,000. The patient was operated on the same day. The diagnosis of the surgical specimen was acute suppurative appendicitis, with areas of gangrenous necrosis.

About the fifth day after the operation, the patient experienced pain in the left side of the chest, followed by hemoptysis. There was also some elevation of temperature.

March 9, an examination revealed signs of pleurisy on the left side. Later there were signs of effusion.

March 18, the chest was aspirated and 400 c.c. of foul smelling, purulent material was obtained, a smear of which showed innumerable fusiform bacilli and few Vincent spirochetes. No tubercle bacilli were found.

March 20, the patient was given 0.6 gm. of neo-arsphenamin intravenously.

March 21, a smear from the teeth showed many Vincent spirochetes and fusiform bacilli.

Three examinations of the sputum, March 21 to March 26, were negative for tubercle bacilli. Roentgen-ray examination on the latter date showed the costophrenic angle on the left side obliterated, and slight cloudiness throughout the chest, less marked in the upper part. The diagnosis was: thickened pleura with a small amount of fluid in the left chest. On the same day, the patient was given 0.6 gm. of neo-arsphenamin intravenously.

March 28, the patient complained of pain in the chest and abdomen. He was perspiring a great deal. His temperature was 99.5 F. At his request he was transferred to the Charity Hospital, improved but still quite ill.

CASE 14.—J. V., a man, aged 38, admitted Sept. 24, 1923, had had blood poisoning, Nov. 28, 1922, which followed a cut in the hand. December 3, bronchitis developed, followed by pneumonia. This lasted for about five weeks. He was in bed from Dec. 2, 1922, to Jan. 7, 1923. He improved but did not fully recover. In April and again in May the cough, expectoration and pain in the chest became aggravated. About a week previous to admisison there was intense pain in the right chest, dyspnea and cough. The chest was aspirated at the dispensary and fluid was obtained.

The examination in the hospital showed signs of fluid in the right side of the chest. The teeth showed erosions and cavities, with foul smelling contents. The tonsils were large and cryptic. The cervical glands were palpable.

September 24, the roentgen-ray examination showed fluid in the right pleural cavity, with infiltration very suggestive of tuberculosis. A smear of the pleural exudate obtained was negative for tubercle bacilli. The leukocytes numbered 21,600.

September 29, a thoracostomy was performed, with resection of a portion of the right ninth rib. Foul smelling pus was found in the pleural cavity. This continued to drain for a month. The general condition of the patient steadily became worse.

October 27, the pus from the pleural cavity, whitish yellow, foul smelling, showed innumerable Vincent spirochetes and fusiform bacilli. The condition of the patient was extremely poor, and 0.6 gm. of neo-arsphenamin was given intravenously.

October 29, the washed sputum showed innumerable Vincent spirochetes and fusiform bacilli. The patient died at 1:40 p. m.

CASE 15.—J. H., a man, aged 68, was admitted Jan. 15, 1924, for a prostatectomy.

January 29, the day following the prostatectomy; the chest examination revealed impairment of resonance at the right base, with showers of râles at both bases, more especially the right.

February 2, the patient coughed considerably and expectorated yellowish sputum. The right side of the chest showed definite patches of pneumonic infiltration.

From February 2 to February 23, the course of the disease continued like a pneumonic process with elevation of temperature, the general condition growing steadily worse.

February 23, the patient's lung condition never cleared up. It was noted that the odor of the breath was foul. There was an abrupt change in his general condition. He became restless and delirious, and he died in a few hours.

The necropsy (February 24) showed a number of teeth absent from the lower jaw, a few missing from the upper jaw. Some of those remaining showed fillings. Others showed erosions and cavities filled with foul smelling viscid greenish material. This was especially true of the last molar in the upper jaw on the left side. The gums showed some injection and were overlaid in a few places by thin, viscid material. The pyorrhea was much less marked than the caries. A smear of the material from a carious tooth showed innumerable spirochetes of Vincent and macrodentium types, fusiform bacilli, large curved gram-negative bacilli, gram positive cocci and other organisms.

When the thorax was opened, the lower half of the right pleural cavity laterally and posteriorly contained between adherent thickened visceral and parietal pleura a few hundred cubic centimeters of thin, turbid, faintly green tinged yellowish, somewhat foul smelling fluid.

The right upper lobe of the lung showed in the posterior and dependent portions patches of reddish gray consolidation varying in size up to several centimeters, in some of which there was cavity formation. The inner wall was necrotic, faintly green tinged, yellowish. In the lumen there were masses of necrotic tissue débris apparently and exudate with a foul odor, weak but penetrating. These gangrenous areas communicated with bronchial branches which showed marked swelling and injection of the mucosa, with necrotic material and mucopus in the lumen. There was no consolidation or cavitation in the right middle lobe. On section of the lower lobe, a striking picture presented similar to that in the posterior and dependent portion of the upper lobe. The consolidation and gangrenous ulceration were somewhat more marked here. There was one solid patch in the center of the left upper lobe toward the anterior surface several centimeters in diameter. The lower lobe on section was similar to the right upper lobe, with patches of consolidation in the posterior and dependent portions, with areas of gangrenous necrosis, the cavities varying in size up to several centimeters. In one portion the process reached practically to the pleura, over which there were the adhesions mentioned above.

A smear from an area of gangrenous necrosis of the lung showed organisms indistinguishable from those observed in the smear of the material from the carious tooth.

Histologically, the picture in the lungs was similar to that described in previous cases of spirochetal pulmonary gangrene.

CASE 16.—J. H., a man, aged 26, was admitted, Oct. 6, 1924, with signs of an acute appendicitis for which he was operated on the same day. A gangrenous appendix was removed.

October 8, the patient's condition was alarming, the temperature 102 F., the pulse 130, and the respirations 30.

October 12, the patient was seen in consultation by Dr. Berger, who noted marked oral sepsis suggestive of Vincent's infection. There were signs of consolidation and fluid in the right side of the chest. October 13, the roentgen-ray examination confirmed this diagnosis.

October 16, thoracentesis was done. No fluid was obtained. The pus was thought to be encapsulated.

October 23, a smear from the mouth showed Vincent spirochetes and fusiform bacilli.

October 24, the leukocytes numbered 22,400. The right side of the chest was again aspirated, but no fluid was obtained and it was thought that the pus was probably encapsulated. The presence of spirochetes in smears from the mouth made us suspicious of their presence in the lungs. The patient was very ill.

October 25, a smear from the mouth again showed Vincent organisms. Arsphenamin therapy was instituted, and 0.4 gm. was given intravenously, but the patient died the same day.

The necropsy (October 26) disclosed the teeth in fair condition. A number, however, showed erosions. The gums, especially anteriorly, showed numerous areas of ulceration and discoloration. A smear from an area of ulceration showed innumerable spirochetes of Vincent, macrodentium and larger types, the first type predominating; innumerable fusiform bacilli, and innumerable other mouth organisms.

The right pleural cavity contained a few hundred cubic centimeters of serosanguineofibrinopurulent fluid. There were apparently organizing adhesions between the chest wall and the lung, especially laterally and posteriorly in the lower two thirds. There were organizing adhesions also to the diaphragm and to the pericardium. Between the middle and the lower lobes, about 40 c.c. of clear yellow fluid was found. The left pleural cavity contained about 60 c.c. of blood-tinged fluid. There were some friable adhesions about the lower lobe, especially along the inferior border and posteriorly.

On section of the right upper lobe of the lung, a considerable area of the inferior fourth of the lobe appeared consolidated. Four patches varying in size from 1 cm. to several centimeters showed central ulceration, the cavities varying in size up to 1 cm. in diameter. Three contained thin, slightly viscid, greenish brown, foul smelling fluid. No consolidation was observed anywhere in the middle lobe. Along the inferior border of the lower lobe, there were two wedge shaped sharply demarcated solid areas each about 4 cm. in diameter, apparently infarcts. Along the inferior border of the left lower lobe anteriorly there was a wedge shaped area 6 by 3 by 3 cm., sharply demarcated and apparently an infarct.

A smear made from one of the gangrenous cavities showed innumerable spirochetes and fusiform bacilli, together with innumerable other mouth organisms. The spirochetes were of Vincent, macrodentium and larger types, the first type predominating.

Histologically, the picture in the lung was similar to that described in previous cases of spirochetal pulmonary gangrene, and in places showed changes characteristic of pulmonary embolism and infarction.

CONCLUSIONS

1. At Mount Sinai Hospital, Cleveland, in the course of two years, sixteen cases of pulmonary or pleuropulmonary spirochetosis have been observed. This number gives a better idea of the incidence of this condition than the fact that only fifty-two cases have thus far been recorded in the literature of the United States.

2. In five of our cases in which definite gangrenous necrosis with cavitation was present, arsphenamin treatment apparently prevented death and resulted in practically complete disappearance of all symptoms referable to this condition. Five cases in which there was extensive pulmonary or pleuropulmonary gangrene, and in which no treatment was given or treatment when the patients were moribund, resulted unfavorably. In five of six cases in which there were less severe acute pulmonary lesions, arsphenamin treatment resulted in prompt cure. The sixth patient left the hospital after one injection of arsphenamin.

3. The onset of pulmonary gangrene in the course of any respiratory condition should be suspected when the sputum becomes brown and foul smelling and there is an increase in the severity of the existing signs and symptoms.

4. A diagnosis before any appreciable pulmonary destruction has occurred may be made by the finding of Vincent spirochetes and fusiform bacilli in the sputum (after careful washing).

5. Spirochetal pulmonary or pleuropulmonary gangrene can be prevented by eradicating the primary oral focus.

6. Spirochetal pulmonary gangrene is a distinct entity. It apparently develops as a result of the aspiration of spirochetes and fusiform bacilli from the oral cavity. It may be engrafted on any acute or chronic pulmonary condition, but is usually unrecognized, principally because its symptoms, although characteristic, are attributed to the primary disease. It is a grave complication, and if untreated is frequently the cause of death. Arsphenamin therapy is apparently as specific in this as in other spirochetal infections.

ABSTRACT OF DISCUSSION

Dr. Joseph Sailer, Philadelphia: The beginning of all treatment is diagnosis. Diagnosis involves etiology. When the etiology of the condition is known, we are aware at once, or at a later time, by experiments, whether or not any specific treatment exists. If it does, we apply it and the patient gets well; if it does not, we make an effort to discover the specific treatment. The diagnosis of pulmonary gangrene is not difficult to make in the majority of cases. We may be aided by physical signs, by roentgen-ray studies and by examination of the sputum; examination of the sputum is of prime importance. The specific agent having been discovered (Vincent's spirillum), rational treatment is readily employed. During the war, I had no recognized case of gangrene of the lung, but there were always in the base hospital a large number of cases of Vincent's angina, which we had no difficulty in curing with arsphenamin or similar preparations. Vincent's angina is not unknown among the wealthier class of patients. I have, to the surprise of dentists, found it in the mouths of persons in whom it would never have been suspected. It has occasioned cases of persistent, chronic sore mouth for which there was no previous explanation. I believe that Vincent's angina is not uncommon among all classes, and that probably under certain conditions, such as previous infection or injury, it may develop gangrenous pulmonary conditions. The earlier the diagnosis is made, the greater is the possibility of cure, when the proper treatment is employed. Dr. Berger's paper is interesting and valuable from another standpoint, for it shows how a well known organism may become very serious in some of its manifestations. Entirely apart from the spirochetes of syphilis, we have spirochetal organisms capable of producing a variety of diseases, some of which can be very serious. I have seen two cases of infection with *Leptospira icterohemorragiae*, the organism of infectious jaundice, which experimental workers have found to be a worldwide disease. This has been recently added to the group of spirochetal diseases. It differs from the others in this group in that it is not amenable to treatment by arsphenamin. It is exceedingly important that a more thorough study of the morbidity occasioned by the organisms of the spirochete group should be undertaken, not only to gain information on gangrene of the lung and other serious conditions produced by the spirochetes, but also to discover new forms of disease produced by them.

Dr. Albert E. Roussel, Philadelphia: It is quite possible that cases of spirochetal pneumonias may be more numerous than we think. I have reported two cases that occurred in my service at the Polyclinic Hospital. They were treated in the wards of the hospital in which were kept influenza and bronchopneumonia patients. The physical signs were those seen in the last epidemic of influenza. The sputum was suggestive of bronchopneumonia or influenza. There was a "cranberry" rather than a pink type of pulmonary congestion. The use of neo-arsphenamin resulted in recovery. In both cases the spirochetes were recognized. I think it is possible that a larger number of these cases would be found if we made a systematic search in respiratory cases, particularly if dark field examina-

tion was made. On the other hand, it is interesting to note that in my ten years' service at the Eagleville Sanitarium for Tuberculosis, no such cases have come under my observation. In every case a microscopic examination of the sputum should be done to rule out this condition.

DR. B. S. KLINE, Cleveland: In these cases, there is usually pyorrhea or an active lesion in the mouth, with the Vincent organism. In one case, at necropsy, a molar tooth was found filled with a greenish deposit that contained many spirochetes. The organism is best stained by the Fontaine silver impregnation method. It is a gram-negative organism. The majority of the organisms in early pulmonary lesions are of the Vincent type. On a slide they show bronchial and peribronchial infiltration. The lung has a moth eaten appearance. It is mottled with gray-green, foul-smelling masses, containing the Vincent organism. These lesions are scattered throughout the lung, and are often apical, so that they are very easily confused with tuberculosis of the lung, both clinically and roentgenographically. There are no ridges or bridges, as in tuberculosis. The cavities are hollow spheres. The organisms spare nothing, and only a few shreds of tissue are left hanging to the lumen of the vessels. The lung tissue will often show healed, healing and actually gangrenous lesions. An interesting complication in one case was brain abscess; the abscess had the peculiar brownish-greenish-grayish look of the lung lesions, and had a number of spirochetal organisms.

CONTROL OF UTERINE HEMORRHAGE BY THE ROENTGEN RAY*

WILLIAM S. NEWCOMET, M.D.
PHILADELPHIA

The sensibility of the organs of generation to irradiation has been proved by a number of experimenters, and, while exact figures may differ to some degree as to the amount of irradiation required and the results produced, the fact remains that generative cellular elements are the most susceptible of all the cells of the body. It may be safely stated that they undergo a retrograde change from the influence of about one half the amount of irradiation tolerated by other cells. These experimental facts are based on the normal cell and not on cells influenced by local inflammatory or general systemic changes that are usually observed in cases of metrorrhagia or menorrhagia. The question now arises as to what extent irradiation influences cellular elements under these altered conditions.

In the last decade, radium has been employed by many operators for the control of hemorrhage in certain benign diseases of the uterus, with success in many instances, and very few poor results. The usual procedure has been to introduce from 50 to 100 mg. with proper filtration, into the uterine cavity and leave it for from four to eight hours. Any one familiar with the action of radium knows that if the same amount is placed on the skin or mucous surface, there will follow a reaction, which will result in an ulceration of several weeks' duration, and the subsequent formation of a certain amount of scar tissue, and, in some instances, after primary healing has taken place, a secondary ulceration may follow. This secondary ulceration is often troublesome in surface cases, and when produced on mucous surfaces of the vagina or uterus, may be the cause of bleeding that is occasionally observed several months after the application of radium. In some instances following these intra-uterine applications, there has also been considerable general disturbance, which, at times, has been alarming.

With these facts in view, the question of treating a certain number of these cases with the roentgen rays was presented to Dr. Girvin and his staff at the Presbyterian Hospital about four years ago, and they supplied a number of carefully selected cases. Those first treated were women about the time of the menopause with an enlarged uterus, having excessive and prolonged bleeding at their natural menstrual periods. The success in this class led to the selection of patients having small fibroids on whom operations were not advisable. The field was gradually extended until patients suffering from other causes, such as excessive bleeding in anemia, cardiovascular disease and pulmonary tuberculosis, were included. At the same time, the age limit was lowered and it was surprising to note that bleeding in women of from 30 to 35 years was controlled almost with the same ease as those near the age of 50 years, or the natural menopause.

It is recognized that there is nothing new in the treatment of benign uterine conditions with the roentgen rays. Their use was recommended by many authorities fifteen or twenty years ago, but the scarring and skin changes observed after the application of the dosage usually employed deterred most practitioners from recommending their general use. The patients in this group were given extremely mild treatments, and the results produced by this method were equal to those in which heavy dosages had been previously employed. It also appeared possible to obtain rather surprising results in checking bleeding without the usual unpleasant after-effects. In a series of sixty selected patients, only three failed to respond to treatment. In these three, there was absolutely no control of the bleeding, and similar failures have also been observed when a heavy dosage of roentgen ray and radium was employed. In a number, the influence was only partial; in some, lasting for only a few months, while in most of the cases treated, the amount of bleeding was less, usually controlled in proportion to the amount of irradiation given, the idea being to administer that amount of irradiation which would control the bleeding without checking the natural menstrual period. It must be stated, however, that so far we have not been able to produce this result every time it was desired.

The mild character of the treatments is well illustrated by the fact that in the whole series, the pubic hair was retained, but in a few, there was a slight tanning of the skin, which naturally was observed in those cases in which the treatment was repeated several times.

METHOD OF APPLICATION

The body of the patient was covered completely with a leaded rubber sheet or thin lead plates, and four areas over anterior portions of the pelvis, each 2 inches square, were exposed for four minutes, at a 10-inch focal distance, to rays produced by a current of 4 milliamperes, 8 inch spark gap, and filtered by 3 mm. of aluminum. The future applications depended largely on the effect accomplished by the first séance. If there had been very little effect and the hemorrhage was severe, a second application on the back was given at the end of three weeks, provided the condition of the patient warranted it. In making the posterior application, the same technic was used as that employed in the application anteriorly, except that five areas were exposed, three in the center line over the sacrum, and two on the buttocks, in the form of a cross. The next application was repeated in six weeks or two months,

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if needed, and certain modifications were made according to the requirements of the individual case. If there was the slightest evidence of tanning of the skin over the pelvis, further treatment was withheld, but, in cases in which irradiation was required, the anterior and posterior areas were avoided and four areas were selected on the right and left sides, cross-firing the pelvic organs.

While there was no observable dermal change in most of these patients, it seemed strange that a number were more or less nauseated for several days after treatment. This nausea was not the result of the effect of the nitrogen gas poisoning, as the air in the rooms in which the treatment was given was not bad, but appeared to be the local effect of the treatment on the pelvic organs. In one instance, a patient with a fibroid with marked endocardial involvement showed a general reaction after each treatment, suffering from intense nausea and vomiting for a week afterward, so that it was necessary to confine her to bed, and yet there was absolutely not the least sign of any local disturbance on the skin. In fact, a patient treated with radium also complained of the same effect, the details of which will be mentioned later.

Roentgen-Ray Treatment of Uterine Hemorrhage in Sixty Women

Total number of patients treated	60
Metritis local pelvic inflammation	40
Fibroid tumors	10
Fibroid tumors, complicated with cardiac conditions	3
Fibroid tumors, complicated with renal disease	2
Fibroid tumors, complicated with anemia	2
Pulmonary tuberculosis, pelvis normal	1
Pulmonary tuberculosis, endometritis	1
Renal disease, pelvis normal	1

NUMBER OF TREATMENTS REQUIRED TO CONTROL HEMORRHAGE

Treatments	1	2	3	4	5 or over
Cases	7	25	10	8	6
Not controlled cases	.	..	1	.	3

Ages of patients	30	40	45	50	55	60	Not given
	4	10	10	14	3	1	18

Hemorrhage controlled, but continued to menstruate	6
Hemorrhage controlled, subsequent roentgen ray	4

The usual phenomena incident to the change of life was observed in many in whom the menses were suppressed, also in several in whom there was only a temporary suppression of menstruation. A few thought the symptoms were unusually severe, and they naturally placed the blame on the irradiation. However, from observation, they did not seem to suffer more than is usual with women undergoing the same change in normal life.

ADVANTAGES OF ROENTGEN RAYS

The advantages of the roentgen rays compared with radium for the control of hemorrhage in these benign uterine conditions appear to be many, with very few disadvantages. They can be easily applied and cause no discomfort, a factor to be considered in the treatment of elderly single women. The treatment consumes less time, the patient is not incapacitated, but can follow her usual vocation, and, while the periods between treatments may be longer, the dosage is more easily controlled, as there is no extensive preparation, the patient is not confined to bed, and she can be more readily induced to submit to treatment. From a physiologic standpoint, it appears to be more rational. The trauma on the uterus is decidedly less, and the intense local reaction usual to radium is avoided, the effect of the roentgen rays being more generally on the pelvic organs.

One patient, not included in this group, was treated with radium applied on the abdomen to simulate the manner of radiation given by the roentgen ray. It required a long time of exposure, as only a small amount was applied in a number of different positions over the lower part of the abdomen. Its routine use is not warranted, except under conditions in which the roentgen rays cannot be conveniently employed. In this instance, 100 mg. was applied over the anterior portion of the abdomen for twenty-four hours. It was moved every two hours and was filtered by 1 mm. of lead and 2 cm. of wood. When it is possible to command large quantities of radium, the time of exposure will be materially lessened.

In two instances, the roentgen ray was used to control bleeding in very large fibroids, in which radium could not be used internally as the os could not be found, and operation was impossible because of the profound anemia. It was necessary in these cases to use many more areas on the abdomen, back and flanks, but the dosage was the same and there was no local disturbance of the skin. After the hemorrhage was controlled, the uterus contracted to such a degree that the os could be easily located and radium was then employed within the uterus.

Two patients who failed to respond to treatment suffered from a polypod endometritis, and, as these patients had purely a local endometrial disease, it is evident the amount of irradiation on the uterine body was not sufficient to control the bleeding.

The younger the women, the greater the tendency toward the reestablishment of the menstral function; and, in some of these patients, there was a reestablishment of function without hemorrhage. In others, there was a tendency toward free bleeding, and, in those patients who had a second series of treatments, bleeding was again controlled. There were six patients who continued to menstruate regularly after treatment although the bleeding was checked. In four others, it recurred from one year to three years after treatment.

It may be safely stated that in 75 per cent. all bleeding was checked from the effect of the first series of treatments, but it can easily be seen that more time will be required before exact figures can be obtained on this point.

It is of interest to note that in the majority of these patients, the hemorrhage stopped after a few treatments. Of the sixty patients, in seven, bleeding stopped after one treatment; in twenty-five, after two treatments; in twelve, after three; in eight, after four, and eight required five or more. The majority of those requiring five or more treatments had fibroids. However, one patient, a very small, thin woman, aged 45, suffering from chronic pulmonary tuberculosis, with very free and profuse bleeding at the menstrual period sometimes lasting a whole month, required four treatments. A year later, menses recurred, and, fearing further trouble, a fifth treatment was given, thus placing her in the five-treatment class. Four others were retreatment patients under similar conditions.

The majority of those treated suffered from a metritis modified with more or less ovarian or tubal inflammation. This group numbered forty. There were ten who suffered from fibroid tumors uncomplicated, while three others had severe cardiac complications, two had kidney complications and two, a profound anemia. In the three remaining patients,

no local disease could be demonstrated, and bleeding was supposedly the result of a general systemic condition; there was pulmonary tuberculosis in two and a chronic nephritis in the other.

It was surprising to find that many of the patients who complained of pelvic pain and backache were relieved by treatment, no doubt incident to the subsidence of the low-grade inflammatory condition that previously existed in the pelvis. Yet, from the fact that many others expressed themselves as being free from headaches, digestive disturbance and other symptoms complicating these pelvic disorders, one is led to think that there is also a psychologic influence that must be considered.

CONCLUSION

I wish to emphasize the fact that uterine hemorrhage from general systemic or local benign origin, of many different forms, can be controlled by a rather mild roentgen irradiation of such dosage as to leave no perceptible change of the skin over the pelvis, which is used as the port of entrance. In those cases in which a larger amount of irradiation is desired, a larger number of ports of entrance should be used. If this mild irradiation fails, I feel that heavy irradiation will also fail. In some instances, it is possible to control the bleeding without causing a cessation of menstruation. This result, however, is not always obtainable, and in women nearing the menopause, the control of bleeding is likely to lead to a permanent cessation of menstruation.

ABSTRACT OF DISCUSSION

DR. JOHN GIRVIN, Philadelphia: I took up some years ago with Dr. Newcomet the possibility of controlling by mild roentgen-ray irradiation cases in which we wanted to retain the menstrual function if possible, or to lose it with as little systemic effect as possible; and secondly, with the hope that in cases of excessive bleeding we might control or stop the bleeding and still retain the child-bearing function. We have not had as yet any case in which we have been able to check the bleeding and yet have a return of menstruation and pregnancy take place. The type of cases that are most effective are those approaching the menopause. In many cases bleeding is excessive at that time, and it is not due to any very distinct pathologic finding. One may find a little symmetrical enlargement of the uterus, or a slight displacement. These cases seem to respond very well. In subinvolution of the uterus when medication has not seemed to affect it, the roentgen ray has had a rather remarkable effect in causing contraction. We have had two or three cases in which menstruation ceased for several months and then returned. In a few fibroid cases, those in which one finds small nodules subperitoneally, we have had some very good results. In cases in which the mucous membrane was particularly affected, such as polypoid endometritis or submucous fibroids, we have had our worst results. I do not think that we can say really that we have had any result in that class of cases. The great advantage in most of these cases is the fact that we get results without the trauma that comes from using radium, and if an operation becomes necessary, as it has in two or three of our cases, it does not complicate the operation. In fact, those cases in which we have operated after the use of the roentgen ray have done unusually well.

DR. G. M. LAWS, Philadelphia: This small dosage irradiation seems to meet the indication for radium without trauma and without hospitalization. To estimate its value from the standpoint of efficiency and safety, I reviewed the records of thirty-seven patients that Dr. Newcomet has treated for the gynecologic staff. They were proved to be benign by curettage or other operation in 70 per cent. of cases, and no case has subsequently been found to be malignant. Of these thirty-seven patients, more than half were under 40 years of age, and none of them subsequently became pregnant. The pathologic conditions were: small fibroids, some with mild pelvic inflammatory disease: metritis, or myopathic hemorrhage, sometimes associated with heart disease or syphilis; certain cases characterized by hyperplasia of the endometrium; and a few cases in which the bleeding followed operation for pelvic inflammatory disease, in which there was conservation of an ovary, and the bleeding was thought to be due to a cystic condition of the ovary. The results were, as a rule, fairly satisfactory; sometimes they were ideal. While the hemorrhage was controlled less positively and less promptly than by the usual effective doses of radium, the treatment seemed to be under better control, and, as a rule, permanent cessation of menstruation did not result unless the woman was old enough for that to be negligible. We feel from this experience that mild inflammatory disease does not act as a contraindication to roentgen-ray therapy as it does to radium, and that therefore in a small fibroid with inflammatory complications, the roentgen-ray treatment would be the treatment of choice. Another point is this, that when operating for pelvic inflammatory disease, it is a comfort to the operator to feel that in the event of menorrhagia later on, he can control it by roentgen ray, and therefore can be a little more conservative than otherwise.

DR. HENRY SCHMITZ, Chicago: In order to apply the correct treatment in uterine hemorrhages of benign origin, we divide them into four groups: (1) the myomas of the uterus; (2) the hemorrhagic metropathies or functional bleedings; (3) the hemorrhages due to inflammatory conditions of the uterus and adnexa and displacements of the uterus, and (4) the symptomatic bleedings which are secondary to other primary conditions, as tuberculosis, heart disease and kidney disease. The indications for treatment are based entirely on this grouping. We invariably precede the radiation treatment with a dilation of the cervical canal and a curettage, for it is an impossibility to know whether there may not be a hidden malignancy in these conditions. The cases in Group 3 are never treated with radiation, because if we remove the cause the hemorrhages should cease. Intramural myomas of the uterus, free from degeneration and complicating diseases of a size of a ten or twelve weeks' pregnancy, are treated with radium in very small doses to control the bleeding, but not to arrest menstruation. We use an intra-uterine applicator which has a diameter of 1 or 1.5 cm., so that we really use distant application of radium and not contact application. We give only from 200 to 300 mg. element hours in the majority of these cases to control the excessive bleedings, and have the satisfaction that these patients continue to menstruate. In the essential hemorrhages we distinguish between the hemorrhages occurring at the beginning of menstrual life and those at the cessation of menstrual life. These are the two periods in which they usually occur. In the former, we wish to arrest the bleeding but under no circumstances stop the processes of menstruation and gestation. Here again we use very small doses of 200 mg. element hours and wait at least three months before resorting to a second application, which is rarely necessary. The menopausal bleedings are treated the same as the myomas. In the symptomatic bleedings we apply the radium for the control of the bleedings in case the hemorrhage is so severe that it contributes to the clinical process of the primary disease, such as tuberculosis or heart disease. The roentgen rays are used in very large fibroids, when we surmise that the administration of the radium will probably not control the bleeding or the growth, since the action of radium is purely local. Here we desire the so-called homogeneous penetration of the entire tumor with the roentgen ray. On the other hand, if we should have to use the roentgen ray in the essential or symptomatic bleedings, then we can use a very simple method of calculating the dose. We know that the ovaries lie from 6 to 7 cm. beneath a line drawn through the anterior superior spinous process of the ilium. If we wish temporarily to arrest the function of the ovary, i. e., destroy the maturing follicles, we should apply from 15 to 20 per cent. of an erythema skin dose at the ovaries. After six or seven months, the remaining primary follicles will have matured and menstruation is reestablished. On the other hand, if we wish

completely to destroy the function of the ovaries, then we should apply a dose of at least from 30 to 35 per cent. of an erythema dose, which will destroy the primary follicles. This effect has been termed roentgen-ray castration. The point I wish to emphasize particularly is that we should never treat uterine hemorrhages unless we have made a diagnostic curettage to exclude the presence of malignancy.

DR. B. H. ORNDOFF, Chicago: The complication of a fibroid by an inflammatory condition in the pelvis is very essential in order to determine the proper character of treatment to be applied, and in this diagnosis I wish to emphasize the importance of pneumoperitoneum in pelvic diagnosis and the use of a peritoneoscope for making direct observations in the pelvis. With pneumoperitoneum or with the abdomen filled with a gaseous medium, the vacuum in the abdomen is released and the organs can be displaced from their usual positions. Those fixed in a definite position can be determined, and by fluorescent screen observations and by films made of the pelvis in the proper position, data can be secured with regard to pregnancy and for the presence of tumors and other pathologic conditions that can scarcely be secured in a positive way by any other method. With the abdomen filled with a gaseous medium, an instrument which we have termed the peritoneoscope, which is a modified Jacobæus thoracoscope, can safely be inserted in the abdominal wall, and with the patient in the proper position, with the hips elevated above the shoulders, so that the organs will fall out of the pelvis (those that are not fixed in that position) an inspection of the pelvic organs often serves a purpose in differentiating pathologic conditions at this point, which can not be secured short of a laparotomy or surgical examination. I believe that the importance of these examinations should be emphasized, and large institutions where numbers of cases are handled should have these available methods of diagnosis.

DR. DUDLEY MACKEY, Bloomfield, N. J.: A woman, aged about 45, was told she had a fibroid of the uterus. She was referred to a specialist for radium treatment. Because of the position and size of the fibroid, radium was contraindicated, and a report was made that the use of the roentgen ray would cause a necrosis of the intestine in this area. I desire to know whether treating a patient under such circumstances would endanger the intestinal tract when deep therapy is used. The patient was later operated on and died.

DR. OSCAR L. NORSWORTHY, Houston, Texas: Though tumors projecting into the uterine cavity are generally accepted as operative cases, there are some cases of uterine hemorrhage caused by the presence of nonmalignant growths, both intra-uterine and extra-uterine, that are safest treated with radium. Knowledge of intra-uterine conditions are next in importance to that of extra-uterine pelvic complications in deciding for or against radium and the technic of its application. A fairly accurate idea of the shape and size of the uterine cavity can be arrived at by careful use of a uterine sound, and the study of scrapings from the cavity will differentiate the type of growth. Long nonflexible applicators cannot be placed so as to conform to a tumor projecting into the uterine cavity, nor can they be placed so that a tumor situated on the fundus and one on the body can be irradiated at the same time.

DR. JOHN S. DERR, Atlanta, Ga.: I treated the first case of essential uterine hemorrhage treated by irradiation in Atlanta, Ga., in 1914, with excellent results. I used the old gas water-cooled tube with the short focal distance and only leather filtration. The woman was 40 years old at the time, and she is still young looking. Since that time I have treated more than 100 cases of uterine hemorrhage and fibroid tumors. I have had fibroids reaching up nearly to the umbilicus practically disappear under roentgen-ray treatment. It is certainly a pleasure to hear Dr. Newcomet favor the roentgen ray rather than radium in the treatment of these conditions. I have never yet failed to stop a case of hemorrhage by roentgen ray, and have had three previously treated with radium. Dr. Pfahler some years ago reported a case of fibroid tumor that he treated with roentgen ray and the woman afterward married and came to a successful pregnancy and was delivered of a normal child.

DR. WILLIAM S. NEWCOMET, Philadelphia: In practically all of these cases curettage was done except in those in which a cardiac or a lung condition would not permit anesthesia. Answering Dr. Mackey, in regard to the patient who died, what condition did they find at operation?

DR. MACKEY: Uterus adherent to the bladder, a large nonmalignant fibroid.

DR. NEWCOMET: One cannot for one minute conceive why the case could not be treated, and safely treated, too. With mild irradiation, radium might have been employed, but it cannot be denied that the roentgen ray would have been safer. Dr. Schmitz called attention to the fact that when radium is placed in the uterus for the treatment of these tumors, it is not expected that this is going to radiate the tip of that mass. That was just the point that I brought out in the paper. With radium, it is a close-up radiation. We all know that the radiation spreads out inversely as the square. Well, naturally a comparatively short distance rapidly lowers the effect of the radium, and, when there is an application as shown in the charts of Dr. Norsworthy, the amount of radiation on the inner side of the tumor and the amount of radiation on the outer edges differ enormously. Therefore, we cannot believe that all the retrograde change of the tumor is entirely due to the radiation of the tumor mass. It is due to the effect of the radiation on the endometrium of the uterus. The retrograde changes in a pelvic mass, when the roentgen rays are used, are due to the changes produced in the pelvic organs. One is a general reaction on all the pelvic organs, while the other is a purely local reaction on the endometrium of the uterus.

DUODENAL ANTIPERISTALSIS

FURTHER OBSERVATIONS *

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That the peristaltic wave in the gastro-intestinal tract is normally in an analward direction is, I believe, axiomatic, with the exception of the proximal portion of the colon. Here antiperistalsis has been so commonly observed that it is certainly accepted as the usual, if not the normal, procedure.

A perusal of the literature on antiperistalsis in the duodenum offers so many disappointments that one approaches this subject with some trepidation. It is, of course, a matter of common knowledge that the peristaltic wave reverses itself in obstructive lesions at or near the duodenojejunal junction, whether the lesion is intrinsic or extrensic to the intestine. Cole and Holzknecht, independently of each other, experimentally produced this in 1910 by mechanical blocking of the lumen. Joseph and Metzler,[1] in rabbits, and Wheelon and Thomas,[2] in dogs, studied the motility of the duodenum by means of balloons anchored in the duodenum and antrum, but they observed no antiperistalsis. Thorning and Smith[3] observed antiperistalsis in a dilated duodenum due to extensive adhesions in the ileocecal region, and they deplore the paucity of literature on the subject. Alvarez,[4] in his extensive work, has observed retrograde peristalsis in all portions of the gastro-intestinal tract, including the duodenum, and

* Read before the meeting on radiology in the Section on Miscellaneous Topics at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Joseph and Metzler: Am. J. Physiol. **27**: 31, 1910.
2. Wheelon, H., and Thomas, J. E.: Am. J. Physiol. **59**: 72-96 (Feb.) 1922.
3. Thorning and Smith: Tr. South. Surg. A. **30**: 176-185, 1917.
4. Alvarez, W. C.: Reverse Peristalsis, J. A. M. A. **69**: 2018 (Dec. 15) 1917.

has found colonic contents on the back of the tongue. He describes the retrograde rushes quite clearly, while Henderson [5] of Toronto doubts the existence of such a thing, saying: "A true reverse peristalsis, I believe, has never been observed."

Arens [6] has observed retrograde peristalsis at this point more than a hundred times in a series of approximately 300 gallbladder cases, and attributes the phenomenon to an associated duodenitis. Paul Eisen [7] has observed the condition only nine times, each with a different existing pathologic condition, and remarks that "the absence of regurgitation is especially noticeable in cases of diseased gallbladder where one would expect to find it." My own observations would lead me to take the point of view just expressed.

In a recent preliminary report,[8] I presented a series of thirty-five cases of duodenal regurgitation, ascribing its causes to the presence of hookworms with the associated duodenitis. With the original report as a basis, it is now my purpose to review the already reported cases together with a large number observed since that report and to present additional findings.

PATHOLOGY

In describing the changes in hookworm disease, Darling [9] states that the pathologic changes due to hookworm are caused in part by oozing of blood from the worm bites (hemorrhage), and by the bacterial invasion of the mucosa. Hemorrhage of greater or lesser severity always accompanies *Ancylostoma duodenale*, with its formable hook-mouthed parts, and the worms are seen to have blood in the intestinal tract. At necropsy, in severe cases, the mucosa of the small intestions is dotted over with minute worm bits, some of which have blood stained margins, indicative of the source of the blood that bathes the mucous surface near by.

In mild infections, the lesions consist of minute tears in the mucous membrane and of small hematomas, or blood cysts, in which adult worms may occasionally be found. Solitary ulcers 2 cm. in diameter may arise on these blood cysts, for they communicate with the lumen of the intestine. In severe infections there is a bacterial invasion of the tunica propria of the mucosa, their entrance probably effected through the worm bite. A chronic inflammatory reaction follows the invasion, which would seem also to be the cause of the peculiar intermittent fever characteristic of severe infections.

GENERAL CONSIDERATIONS

In the first few instances in which antiperistalsis was seen, little significance was attached to it, and no explanation was offered beyond the statement that it was commonly seen in obstructive lesions at this point. Its observation in two brothers on the same day, in whom obstruction obviously did not exist, and for which no pathologic reason could be ascribed, served to stimulate my interest and gave impetus to my investigation. The laboratory reported a marked eosinophilia in the two patients and gave a positive report for hookworm ova in the stool. It occurred to me that the presence of the worms, together with the associated duodenitis and ulcer formation, might be the explanation. Blood and stool examinations were at once determined in all patients who presented this condition and with whom the proper cooperation could be secured.

5. Henderson, V. E.: Canadian M. A. J. **13**: 560 (Aug.) 1923.
6. Arens, R. A.: Personal communication to the author.
7. Eisen, Paul: J. Radiol. **4**: 388 (Nov.) 1923.
8. Henderson, W. F.: Antiperistalsis in the Duodenum: A Presumptive Sign of Intestinal Parasitosis, J. A. M. A. **84**: 493-494 (Feb. 14) 1925.
9. Darling, S. D.: International Health Board Report.

Retrograde peristalsis, as I have observed it, has commonly been seen in young subjects, usually in the second and third decades. The examination is not other than that of the usual barium meal procedure employed in routine gastro-intestinal work. The patient is observed in the upright position and, since a barium filled stomach displaced backward by pressure could obstruct the lumen of the intestine, the gloved hand is never used for manipulation of the stomach, it being allowed to empty itself unaided. For obvious reasons, antiperistalsis in the prone position has been disregarded. When pylorospasm prolongs itself unduly, the patient is allowed to sit in an anteroom until its disappearance.

The roentgen-ray examination shows little or no cardiaspasms, although hyperperistalsis accompanied by considerable pylorospasm is the rule. It will be observed that the behavior of the stomach is not unlike that observed in the commonly seen duodenal ulcer of peptic origin. In addition, the spasmodic manifestations extend to the duodenum itself, the food passing slowly and apparently with some difficulty to the duodenojejunal juncture, where it pauses and passes backward to the bulb, after which it oscillates between these two points from two to eight times, or, in rare cases, even more. The stomach frequently shows some residue at the six hour examination while the head of the meal is usually at or beyond the splenic flexure.

The antiperistaltic wave in this condition is a clear cut, copious discharge backward to the bulb, appearing not unlike a fluid propelled from an ordinary piston syringe, and is not to be confused with the antiperistaltic rushes described by Alvarez, in which he observed that the duodenal contents continued their analward motion, while a fleeting wave passed in the opposite direction, much as a ripple might pass upstream on the surface of a moving column of water.

Antiperistalsis has been noted in a total of 102 patients, with positive stool reports for hookworm ova in ninety-five cases (93 per cent.). Of the seven cases reported negative for ova, two were dismissed with a single stool examination, which, in the light of subsequent investigation, I consider insufficient evidence; cancer of the head of the pancreas accounted for one; acute pancreatitis for another; enlarged tuberculous lymph nodes with external pressure for another, and cholecystitis for the remaining two.

REPORT OF CASES

CASE 1.—J. J., a man, aged 32, whose family history was of no particular interest, had been treated by his own physician "all his life for stomach trouble." The patient was poorly developed and poorly nourished. He weighed 121 pounds (55 kg.). The sclerae were yellow, and the skin had a dry, leathery appearance. The remainder of the physical examination was negative.

A barium meal was given. One and one-half hours' waiting was required before the stomach could be induced to begin emptying, at which time a normal stomach and cap were observed with hyperperistalsis and hypermotility. Antiperistalsis in the second and third portions of the duodenum were pronounced. The roentgen-ray diagnosis was: intestinal parasites. The laboratory report showed: red blood corpuscles, 4,000,000; eosinophils, 9. The Wassermann reaction was negative. The malaria test was negative. The stool contained a large number of hookworm ova.

The patient received five treatments of thymol; his digestive disturbances have disappeared; a gain of 14 pounds (6.4 kg.) was observed by his physician, and the man is now back at work apparently well. A reexamination showed no antiperistalsis or other pathologic condition.

CASE 2.—Miss C. G., aged 17, whose family history was negative and who had had the usual diseases of childhood, with no serious illness, complained of inability to sleep; loss of considerable weight; vomiting of food at irregular intervals, and a slight cough, accompanied by such a profound depression that it became necessary for her to leave school. A physical examination by her physician, aside from a moderate anemia, was negative. The stool showed no ova of any kind. A gastro-intestinal study was done by me. No pathologic change was observed, with the single exception of antiperistalsis in the second and third portions of the duodenum. In spite of the previous stool examination, parasitosis was suggested to the clinician. Magnesia magma was given; the laboratory reported a stool positive for hookworm. Two weeks after carbon tetrachlorid treatment, the patient reported a gain of 4 pounds (1.8 kg.), normal sleep and no depression. She returned to school apparently well. There was no opportunity to observe this patient roentgenologically following the treatment.

CASE 3.—Miss R. L. W., aged 21, whose family history was of no interest, had had "stomach trouble" for some years. Her family stated that "spells" of some kind were of common occurrence, and were increasing in frequency. Examination showed her to be poorly developed and poorly nourished, weighing 98 pounds (44.5 kg.). Anemia was evident on casual observation, and the patient appeared listless. The hemoglobin was 60; there was no eosinophilia; the stool was negative for parasites; the Wassermann reaction was negative; the urine was normal, and gastric analysis was not made. The appendix had been removed two years before examination.

The physician requested a roentgen-ray study. The chest was normal; cardiospasm was absent. The stomach, considerably dilated, lay in the pelvis with no waves appearing at the end of half an hour. An hour later, no food had passed through the pylorus. As the patient stepped from the fluoroscope she was seized with an epileptiform attack, which lasted for three or four minutes, immediately after which the stomach began emptying itself. Antiperistalsis of the second and third portions of the duodenum was greatly in evidence. There was some retention in six hours. No other pathologic changes were noted.

The probability of parasites was suggested to the clinician, and after two examinations the laboratory reported positive stools for *Uncinaria*. The patient received three treatments for this condition before the stool was free from ova. She gained in weight. The "stomach trouble," together with the "spells," disappeared, and her physician tells me that she is well.

CASE 4.—J. S. L., a man, aged 30, was operated on in 1919 for appendicitis, with only temporary relief. The weight loss since that time had been 12 pounds (5.5 kg.). Recently, attacks of indigestion had been marked. Sour eructations were common and he was continually swallowing and belching air as though attempting to "scatch himself." He had become despondent over his condition. A recent roentgen-ray examination in a neighboring city revealed antiperistalsis in the duodenum probably due to adhesions about the old appendix scar, and he had come in for an operation for this condition.

He was referred to the roentgen-ray department. The antiperistalsis noted by the other physician was visible at my examination. The laboratory reported the stool positive for the parasites. Appropriate treatment was instituted, and two and one-half months later the patient reported himself as well. No operation was done. Reexamination shows no antiperistalsis, and the laboratory reports show no ova in the stool.

CASE 5.—M. B., a girl, aged 10, had always been sickly; she was unusually bright in school, but subject to constant attacks of digestive disturbances and acidosis. Her physical condition did not allow her to run and play with the other children. A diagnosis of cyclic vomiting had been made by two pediatricians, and of congenital pyoloric stenosis by a third. An appetite for inedible articles (hair, bits of cloth, etc.), had been noted by her parents, and lately she had developed the habit of swallowing and belching air.

I was requested to look at the stomach for a possible bezoar. A roentgen-ray examination showed no foreign body in the stomach, and obstinate pyolorospasm lasting thirty minutes, during which the child vomited once. There was exaggerated antiperistalsis in the duodenum. The examination was otherwise negative. The suggested diagnosis of intestinal parasites was given. The laboratory report showed: hemoglobin, 70; red blood corpuscles, 4,500,000; eosinophils, 12. The stool examination revealed no parasites. The second stool examination after magnesia magma was given revealed hookworm ova. Examination of the stool was reported negative after four months of active treatment. The vomiting had ceased; the digestive disturbances with the abnormal appetite had disappeared. The child is well, and reexamination gives no roentgen-ray evidence of any pathologic condition.

ECONOMIC CONSIDERATIONS

Considerable interest has been shown of late in intestinal parasites throughout the United States. The constantly shifting population, together with the emigrants from the warmer climates, have made this more than a local problem, although it is naturally of more interest and the effects are more widespread along our Southern border. A zone of infection surrounds the earth from about 38 degrees north to 34 degrees south latitude.

In Brazil, Smillie and Darling [10] estimated that the working efficiency of the men on the coffee fazendas, taking fazendas as a whole, was one-fourth less than that of otherwise normal, noninfected men. This decreased production was attributed almost entirely to the hookworms they were carrying. The psychologic board of the U. S. Army officially reported that in the case of 10,000 men at Camp Travis, Texas, tests indicated the mentality of white men with hookworm disease to be about 33 per cent. inferior to the mentality of white men without it.

Williams [11] states that a conservative estimate of the hookworm disease in Harrison County, Miss., in January, 1918, was 20,000 cases in a total population of 35,000. Basing an estimate of diminished production of one-third the figure given above, this would be the equivalent of 6,000 nonproducers in this one county.

COMMENT

I have examined certain of the patients in this series, after treatment for uncinariasis, with the result that those who still showed the phenomenon were sent back for further treatment, at which time multiple stool examinations still showed the presence of ova. In those cases in which, after treatment, the phenomenon had disappeared, it is interesting to note that repeated stool examinations have shown no ova.

The criticism that the roentgen ray has become omnivorous is not a just one. As physicians first, interested in disease, and only later as interpreters of shadows in terms of pathologic changes in particular organs, it is incumbent on the roentgenologists to assist the clinician in whatever way they can. The peptic ulcer commonly seen in the duodenum, with its associated duodenitis, is responsible for the structural and spasmotic changes in the bulb which even a tyro is wont to associate with its true pathology. It is not contended that the hookworms are solely responsible for duodenal antiperistalsis, but it is not taxing our credulity too far to believe that ulcers of this etiology and in this location are able to produce phenomena by which their presence can be detected. It is not unthinkable that a disease which can and does produce clinical manifestations, varying from a mild anemia and indigestion to epilepsy, would make itself manifest when the site of the patho-

10. Smillie and Darling: International Health Board Report.
11. Williams, D. J.: New Orleans M. S. J. 77:360 (March) 1925.

logic changes—the duodenum—is visualized by the barium meal method. In my opinion, hookworm infection must be excluded by careful laboratory work before duodenal antiperistalsis can be attributed with safety to other pathologic conditions.

Corner North State and Manship streets.

ABSTRACT OF DISCUSSION

DR. L. A. FORTIER, New Orleans: This paper is especially valuable to the physicians of the South. The work was made possible by the high percentage of infected persons in Mississippi. The conclusions are very logical. When hookworms are present in patients with abdominal complaints, antiperistalsis is seen. When the patient is freed from parasites, the symptoms, including antiperistalsis, disappear. This happening in all cases proves to me that the parasites are the cause of the reverse peristalsis. Roentgenologists can be of help by asking for feces examinations in cases of antiperistalsis in the duodenum not accounted for by other well known pathologic conditions, as adhesions, gallbladder disease or obstruction of tumors.

DR. L. T. LEWALD, New York: The subject interests me very much, having studied hookworm as a pathologist in the tropics many years ago, and I am rather surprised to find that the control of the situation at the present time is so poor when the etiology is so well known. I had supposed that hookworm was a thing of the past, but apparently it is well to the front. I hope that in his conclusion Dr. Henderson will give us a little more definite way of recognizing the antiperistalsis. I understood him to say that it was not to be seen in the upright position.

DR. W. F. HENDERSON, Jackson, Miss.: In answering Dr. LeWald, I am sure that he misinterpreted what was said. My paper stated that I consider this of importance only when the patient is standing erect, and that for obvious reasons I have disregarded antiperistalsis with the patient in the prone position. I should like to call attention to one particular phase of this. I do not suppose that the physicians in the North and East ever have any trouble with their appendix cases—they probably cure all of them—but in the South most of our patients with chronic appendicitis have just about as much trouble after operation. I cited one case in which a man had been operated on for chronic appendicitis and I would urge that we make sure that when we consider a case as chronic appendicitis we rule out other things. The hookworm is responsible for a very large number of intra-abdominal symptoms; that is, pain and what not. It is very easy to confuse these symptoms with a great many other conditions, and we should at least go very carefully into the case before attributing chronic abdominal pain to an appendix.

Social Worker's Function.—The social worker's function is chiefly therapeutic. A failure to recognize this fact has sometimes resulted in making her chief duty that of financial investigation for the purpose of excluding patients who are ineligible for dispensary care. While in the course of her work she may obtain information regarding finances that is of value to the administrator, obtaining this information should not be her main objective. Not only does this tend to lessen the value of her real purpose but it places upon her a duty that belongs elsewhere. It is likely to place her in a false position with the patient—it may lose for her the friendly relationship with him that is essential for the successful execution of her work. The investigation of the patient's financial resources after a diagnosis has been made when the physician is faced with the problem of prescribing treatment that may be beyond the patient's means is distinctly another matter. Certain adjustments in the home requiring the expenditure of money may be necessary before treatment can be completed. The social worker in making the type of financial investigation that rounds out the physician's effective treatment of the case is not only within her province but she is performing one of her distinct functions.—*Hosp. Social Service* **12**:138 (Sept.) 1925.

OCULAR PHENOMENA PRODUCED BY TEMPORAL LOBE TUMORS*

WALTER I. LILLIE, M.D.
ROCHESTER, MINN.

A detailed study of the ocular changes produced by temporal lobe tumors has been made in order to ascertain the frequency of correct localization from an ophthalmologic standpoint. Cushing's[1] report that perimetric field defects in temporal lobe lesions were of paramount diagnostic value, localizing definitely the site of thirty-three of thirty-nine tumors of the temporal lobe, was a further stimulus to this study.

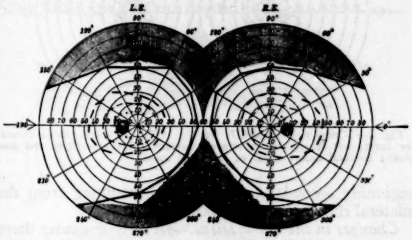

Fig. 1.—Vision right eye, 6/4; left eye, 6/4. Perimetric fields normal for form, right homonymous lower quadrant defect for green; bilateral enlargement of the blind spots.

In a series of 168 cases of certified cerebral tumors examined in the Mayo Clinic during the last five years, sixty were located in the temporal lobes. In all but three of these cases, operation was performed; and in these three, the location was diagnosed correctly, as proved by necropsy. There were fifty-three cases of infiltrating gliomas, three of dural endotheliomas, two of calcified hematomas, and two of angiomas.

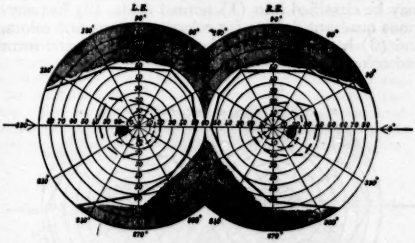

Fig. 2.—Vision right eye, 6/6; left eye, 6/6. Perimetric fields normal for form, left homonymous upper quadrant defect for red and green; bilateral enlargement of the blind spots.

OCULAR CHANGES

The ocular changes may be divided into four groups: (1) changes of visual acuity; (2) changes of the optic disks; (3) changes in the perimetric fields, and (4) oculomotor changes.

Changes in Visual Acuity.—The vision was normal in thirty-two cases, and not determined in nine. In the

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* From the Section on Ophthalmology, the Mayo Clinic.
* Read before the Section on Ophthalmology at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Cushing, Harvey: Distortions of the Visual Fields in Cases of Brain Tumor, VI, The Field Defects Produced by Temporal Lobe Lesions, Tr. Am. Neurol. Assn., 1921, pp. 374-423.

remaining nineteen cases there was visual disturbance in one or both eyes; in four of these cases there was a history of poor vision in one eye. The vision was moderately reduced in two cases in which the fundi were normal, and in one in which there was a mild pallor of both disks. The vision in these three cases was improved by proper glasses. In the remaining twelve cases, the visual decrease was probably due to a

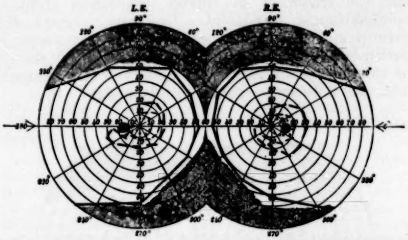

Fig. 3.—Vision right eye, 6/7; left eye, 6/5. Perimetric fields normal for form, left homonymous upper quadrant defect for blue, red and green; bilateral enlargement of the blind spots.

beginning secondary optic atrophy, resulting from the bilateral choking of the disks.

Changes in the Optic Disks.—In forty-five cases there were bilateral choked disks ranging from one-half to 7 diopters swelling. The choking of the disk was higher on the contralateral side as often as on the homolateral side. The choking of the disk was equal in twenty-four cases. In one case there was definite bilateral secondary optic atrophy without edema, at first examination. In thirteen cases the fundi were normal, and in one there was mild pallor of both disks. In all the cases examined, except those in which the fundi were normal and one in which there was mild pallor of the disks, enlarged blind spots were noted.

Changes in the Perimetric Fields.—The field changes may be classified into (1) normal fields, (2) homonymous quadrant defects for colors, and form and colors, and (3) homonymous hemianopia for colors, and form and colors.

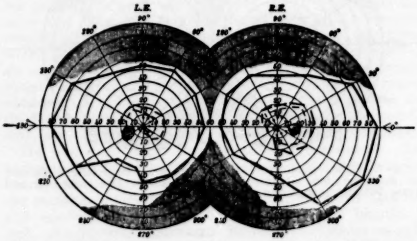

Fig. 4.—Vision right eye, 6/7; left eye, 6/10. Left homonymous lower quadrant defect for form and colors; bilateral enlargement of the blind spots.

1. In eight cases the perimetric fields were normal, both for colors and for form. In three of these the blind spots were enlarged, owing to the choking of the disks; the other five had normal fundi. All the eight cases were infiltrating gliomas, except one, which was a calcified hematoma.

2. There were ten cases of quadrant defect for one or more colors, the defect being in the upper quadrant in six cases, and in the lower quadrant in four. Homonymous quadrant defects for form and colors were present in fifteen cases, nine in the lower quadrant and six in the upper (Figs. 1 to 6).

3. Homonymous hemianopia for colors with form fields normal was present in three cases, while a complete homonymous hemianopia for colors and form was found in fifteen cases. In one case there was a complete macula preservation (Fig. 7 to 9).

Perimetric fields were not obtainable in nine cases because of the mental condition of the patient. In eleven cases of definite aphasia, nine homonymous quadrant defects for form and colors were accurately charted by a simple procedure. Instead of relying on the patient to tell when the object or color is seen, he should be instructed to tap the table as soon as he sees the moving object or the color just named. In this manner a very accurate defect can be elicited if present. Such defects can be verified by repeated examinations.

In this series of sixty cases, seventeen were definitely localized by the perimetric field defects only, as the neurologic findings were only general in character. In contrast, fifteen cases were definitely localized by the neurologic examination, while the ophthalmologic examination was of no localizing value. In six of these cases, the fields were normal; and in nine, the fields

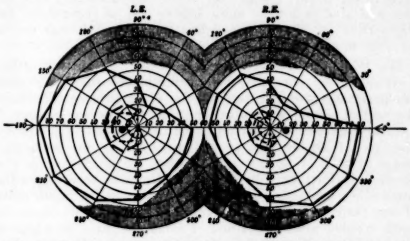

Fig. 5.—Vision right eye, 6/10; left eye, 6/12. Right homonymous upper quadrant defect for form and colors; blind spots normal; fundi normal.

were not obtainable owing to the mental condition of the patient.

Definite localization as to the site of the lesion was possible in forty-three of the sixty cases, from definite perimetric field defects alone, while definite localization was possible in forty of the sixty cases from the neurologic examination alone.

Oculomotor Changes.—The oculomotor changes were less common. There was paresis of the left abducens in six cases, ptosis of the left upper lid in two, partial external and internal ophthalmoplegia in two, and convergence weakness in three. All the oculomotor changes, except the convergence weakness, were located on the left side, but the tumors were equal on the two sides. The cause of this is not known, as the tumors were nearly equally divided, thirty-four in the left lobe and twenty-six in the right.

NEUROLOGIC CHANGES

The neurologic findings, in order of frequency, are: generalized convulsions, partial hemiplegia, transitory numbness of arm or leg, aphasia, jacksonian convulsions, unilateral incoordination, uncinate attacks, and hallucinations of taste and smell. None of the cases presented visual hallucinations of any type.

ROENTGENOGRAPHIC CHANGES

Nothing of localizing value was shown from the roentgenograms of the head, except in the three cases of endotheliomas and in two of calcified hematomas. There were fifteen cases of enlarged sella turcica with

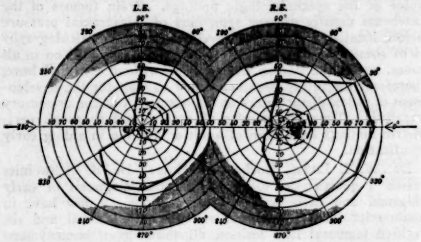

Fig. 6.—Vision right eye, 6/20; left eye, 6/10. Partial left homonymous hemianopia for form; complete homonymous hemianopia for colors; right blind spot enlarged.

and without erosion of the posterior clinoid processes. The remaining cases were negative. The enlargement of the sella turcica is of no clinical importance when associated with bilateral choked disks, except that it is another sign of increased intracranial pressure. Although the enlargement is present in 25 per cent. of these cases, it is also present in about 50 to 60 per cent. of cases of lesions of the posterior fossae, especially the cerebellar. In chiasmal lesions, the sella turcica is enlarged and eroded in about 65 per cent. of the cases, but a lesion in this region is rarely associated with a bilateral choked disk.

SUMMARY

The ocular changes characteristic of temporal lobe tumors are found in the perimetric fields. In the early cases, the homonymous quadrant defects either for

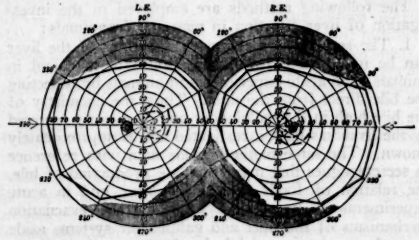

Fig. 7.—Vision right eye, 6/60; left eye, 6/30. Perimetric fields normal for form, left homonymous hemianopia for colors; bilateral enlargement of the blind spots.

colors or for form or for both are common enough to be of great clinical significance, especially if these defects are associated with bilateral choked disks. This was true in forty-three out of fifty-one cases in the series in which the perimetric fields could be charted. No scotomatous defects were found.

These findings agree closely with those published by Cushing in 1921, except for the absence of visual hallucinations in my series of cases. If the homonymous quadrant defect is added to the syndrome of Kennedy,[2] a definite syndrome can be established for temporal lobe lesions.

2. Kennedy, Foster: The Symptomatology of Temporosphenoidal Tumors, Arch. Int. Med. 8: 317-350 (Sept.) 1911.

CONCLUSIONS

1. Temporal lobe tumors are common (sixty out of 168 verified cerebral tumors).

2. Homonymous quadrant defects, either for colors or for form, associated with bilateral choked disks, are characteristic of this location (forty-three out of fifty-one cases).

3. The choking of the disk was higher on the contralateral side as often as on the homolateral side.

4. Visual hallucinations were absent.

5. An ocular syndrome could be established for early temporal lobe tumors; namely, normal visual acuity, bilateral choked disks, and homonymous quadrant defects either for colors or form.

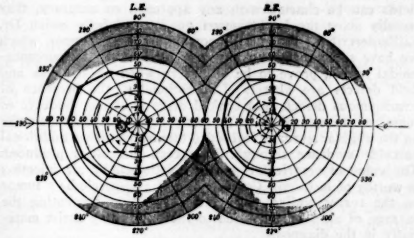

Fig. 8.—Vision right eye, 6/30; left eye, 6/15. Right homonymous hemianopia for form and colors, with preservation of both macula; left blind spot enlarged.

ABSTRACT OF DISCUSSION

DR. EMORY HILL, Richmond, Va.: Localization of tumors of the brain was facilitated by the studies of Foster Kennedy published in 1911, and again by Cushing in 1921. The former presented an accurate picture of temporal lobe tumor with one valuable piece of evidence omitted; namely, the homonymous defects in the visual fields especially prominent in lower or upper quadrants. The latter added this additional evidence, made possible by the use of very small test objects employed to outline the fields. As a result, it cannot be said that tumors of the temporosphenoidal lobe are the most difficult brain tumors to diagnose. Our attention has been drawn too strongly to the cerebellum, because of choked disks, and to the occipital lobes, because of homonymous defects. The combination of these two findings should point to a temporal lobe as the source of a space restricting lesion increasing the intracranial pressure and impinging on the geniculocalcarine

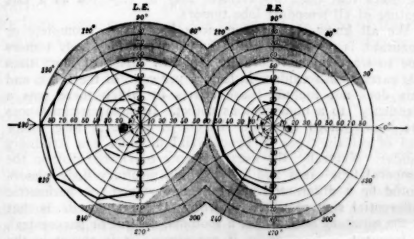

Fig. 9.—Vision right eye, 6/20; left eye, 6/10. Complete right homonymous hemianopia for form and colors; left blind spot enlarged.

visual fibers. Other symptoms of importance are the loss of the abdominal reflex on the opposite side, visual hallucinations, and uncinate attacks; but these should not be overemphasized. Dr. Lillie's contribution suggests that temporal lobe tumors may be much more frequent than we have believed; he finds sixty in a series of 168 cases of certified

cerebral tumors, as compared to fifty-nine in Cushing's series of 276 cases. Visual fields were of great value in both these series, sometimes constituting the determining factor in localization. Uncinate attacks seem to have been of much less importance, while visual hallucinations were absent in Dr. Lillie's series. Cushing found them in thirteen cases. They are of quite striking character when they do occur, and can be distinguished from the vague sensations of light and colors noted in occipital lesions, being concrete images projected in the blind half of the field of vision. Several impressions have been gained from a series of these cases in the department of neurologic surgery, which I have had opportunity to study through the kindness of Dr. C. C. Coleman. The diagnosis, or even the suspicion, of brain tumors is not yet in the minds of the profession as a whole; we are seeing the cases too late. Accurate visual fields are impossible in many cases because of the mental state of the patients. When fields can be charted with any approach to accuracy, they usually show the homonymous quadrant defects which Dr. Lillie describes. Of equal importance, cases of tumor, which we have some reason to expect to find in the temporosphenoidal region, prove to be elsewhere when choked disk and field defects are absent. Unquestionably, the presence of homonymous defects and choked disks is strong evidence of tumor or its equivalent in the temporal lobe. Encroachment on the angular gyrus in left sided tumors furnishes additional valuable evidence through the speech difficulties produced. The value of ventricular puncture followed by air injection is worthy of mention. Compression of a ventricle by a tumor on the corresponding side, and obstruction preventing the passage of air from one side to the other, may assist materially in the diagnosis.

Dr. G. E. de Schweinitz, Philadelphia: The frequency with which distortions of the fields occur with tumor of the temporal lobe is attested by the fact that in only eight of his series of sixty cases "the perimetric fields were normal." In Cushing's notable essay, reliable perimetric charts were obtained in thirty-nine of his fifty-nine temporal lobe cases, and in only six of them "the fields were at all times normal." Naturally, before a visual field can be labeled "normal," the perimetric work must possess the quality of exactness; quantitative perimetry must be employed.

Although color perimetry, for various reasons, is often far from satisfactory, and most of the visual results can be obtained with carefully graded white test objects, it is not quite safe to disregard color fields or, more accurately, what may be discovered with color tests. Doubtless all of us will agree that one examination should be used as a check against the other, but with the greater reliance on the quantitative form and white field, on account of their greater threshold of accuracy. Cushing believes that the homonymous field defects, such as he and Dr. Lillie portray, indicate an involvement of the temporal lobe of the optic radiations, although he notes that tract involvement may be expected as a late feature of all temporal lobe tumors.

We all know that homonymous hemianopia, complete or quadrant, is not infrequently found in pituitary body tumors due to tract interference. In my own series of more than 100 cases it was evident in fully 6 per cent. of the cases, and this does not include those charts in which there was a "tendency" to a homonymous defect. In such circumstances the homonymous quadrant defects of temporal lobe tumor and of certain types of hypophysial disorder are strikingly similar. Naturally, the usual presence of choked disk in the temporal lobe cases and its rarity in pituitary body tumors would be a differential point of importance. A perimetric differential sign of value, on which Traquair dwells, is that in the pituitary body cases, a scotoma, central or paracentral, is frequent, while usually, if not always, it is absent in the temporal lobe cases. In our author's series "no scotomatous defects were found—a confirmation of the statement just made. Traquair believes the scotomas of pituitary body disease represent an acuity of pressure and depend on disturbance of the vascular supply of the papillomacular bundle. Fully admitting the importance of this explanation, it has seemed to me that the possible toxic origin of these scotomas cannot be entirely disregarded, and Dr. Schaeffer and I endeavored to determine the pathway whereby such toxins, if it be conceded that they can be elaborated, could reach the papillomacular fibers.

Dr. A. W. Adson, Rochester, Minn.: I am interested in the series of cases Dr. Lillie has reported, since I operated on the patients at the Mayo Clinic. I wish to emphasize the value of the ophthalmologic findings. Brain tumors of the cerebrum usually present symptoms of intracranial pressure before localizing symptoms develop. While ventriculography is of some value in localization, it cannot be relied on in all cases, nor is the Bárány examination without error. I have, therefore, frequently been compelled to wait for the development of reflex disturbances at the onset of a motor or sensory paralysis. Thus, the results of careful and thorough perimetric findings have been of additional value in aiding early localization.

Dr. W. I. Lillie, Rochester, Minn.: Dr. de Schweinitz raised a question as to the differential diagnosis of early chiasmal and early temporal lobe lesions. I now have in manuscript form a study of six verified chiasmal and six verified temporal lobe lesions, all showing an homonymous notching of form and color fields. The fundi were normal in all the cases. In the chiasmal lesions there was usually a decrease in the visual acuity, and a marked enlargement of the blind spots, while in the early temporal lobe lesions before the appearance of choked disks, the blind spots were normal in size, and the visual acuity was good. In a previous paper on chiasmal lesions, all the early cases in which the fields of vision were still sufficient to map out the blind spots, all were found to be enlarged, and the temporal fields defects for form or colors were continuous with the enlargement of the blind spots. This has not been found in the temporal lobe lesions, even when choked disks are present.

PHYSIOLOGY OF THE LIVER

PRESENT STATUS OF OUR KNOWLEDGE *

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The following methods are employed in the investigation of liver function in man and in animals:

1. The secretory or excretory functions of the liver can be investigated by biliary fistulas in man and in animals or in acute experiments in animals by collecting the bile direct from the duct. Thus, the chemistry of the bile both in the gallbladder and as directly secreted by the liver has been investigated and is approximately known. The same method yields data with reference to secretagogues that may stimulate production of bile, the relation of foods to bile secretion, and in acute experiments it is possible to study the evacuation mechanisms of the duct and gallbladder systems aside from the production of bile by the liver cells.

2. In acute experiments it is possible to collect portal and hepatic blood both during digestion and in fasting. This method has yielded important data on the liver function. The same method has also been employed in investigating various possible detoxicating functions of the liver. The substance or substances under investigation is introduced into the portal vein and an analysis of the concentration or of the change made as they appear or fail to appear in the hepatic vein blood.

3. The Eck fistula operation in experimental animals has also yielded data of importance on the problem of

* From the Hull Physiology Laboratory of the University of Chicago.
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liver function. This operation is the anastomosis of the portal vein with the inferior vena cava so that all of the portal blood is shunted into the general circulation. This method has yielded important data in two directions: (1) the rôle played by the substances absorbed from the alimentary canal in the stimulation of the liver to bile production; (2) data on the apparent detoxicating function of the liver, particularly in connection with protein absorption and protein metabolism.

4. Chemical analysis of the blood and urine in cases of spontaneous liver disease or experimental injury as by specific liver poisons have also yielded some data of importance.

5. Extirpation of the liver in animals has added further data of importance, particularly in the relation of the liver to blood sugar, urea and uric acid. It has also raised the question of why abolishing the liver function, as accomplished by extirpation of the liver, in otherwise healthy animals is followed by death within from twenty-four to thirty-six hours.

6. Direct chemical and histologic analyses of liver tissue have yielded data of importance as to the storage of glycogen and fats in the liver, the storage of iron and other substances and the formation or storage of enzymes, as well as data bearing on the phagocytic activity of the endothelial cells of the liver capillaries.

7. Finally, perfusion of the excised liver has also contributed toward our knowledge of liver function.

It is a commentary on the complexity of the liver functions and the difficulty in securing conclusive data that, despite the pursuit of these various methods by competent investigators, both in the laboratory and in the clinical branches, much remains obscure and uncertain in the matter of liver function. Nevertheless, certain facts are fairly well established, and I propose briefly to enumerate these facts. There is one great difficulty, however, in stating and discussing these apparently established facts; namely, that we cannot always infer that the physiologic disturbances noted after various diseases of the liver are direct or indirect results of the impairment to liver function. Obviously, the results of liver impairment will be the more grave in proportion as any particular function is an exclusive liver function.

I. THE RELATION OF THE LIVER TO COAGULATION OF THE BLOOD

We have fairly conclusive experimental evidence that fibrinogen is produced in the liver or under the direct influence of the liver; at least this appears to be true for regeneration of fibrinogen after hemorrhage. It is also true that decrease in the concentration of the blood fibrinogen has been reported in some cases of liver injuries; but it is striking that there may be a great deal of pathologic change in the liver without disturbance of the fibrinogen concentration or blood coagulation. This can probably be explained in the light of recent evidence that 15 or 20 per cent. of the normal quantity of liver tissue suffices to meet the ordinary bodily needs (Mann). It is further known that under the influence of proteoses the liver produces substances that both accelerate and retard coagulation. Whether the latter group of substances, "antithrombin," is identical with Howell's "heparin," a substance obtained from the liver by Howell which decreases coagulation, even in vitro, is not known. There are further indications of the relation of the liver to blood coagulation in various hemorrhagic diseases, particularly in infancy.

II. THE RELATION OF THE LIVER TO PROTEIN METABOLISM

That the liver in mammals is the chief organ producing urea from cleavage products of protein metabolism and from ammonia absorbed from the alimentary canal has long been held as probable, although not so definitely proved as to go unchallenged. Folin and his co-workers have reported experiments which they interpret as showing that in mammals uric acid, for example, is destroyed principally in the blood; but the recent work of Mann and his associates by methods of total extirpation of the liver seems to show that the liver, after all, is the main organ that forms urea and destroys uric acid. Of course, even these experiments of Mann are open to the objection that the failure to produce urea and destroy uric acid after liver extirpation may be due to indirect impairment of other tissues or changes in the blood composition. At present the latter alternative seems to me the least probable one. Liver perfusion experiments, as well as portal and hepatic venous blood chemistry, seem to show a considerable deamidization in the liver, but this is probably not an exclusive liver function. These processes probably go on to a certain extent in every living cell in the body. While the so-called meat poisoning following high protein diet in Eck fistula dogs indicates a definite rôle of the liver in connection with taking care of some of the immediate end-products of the protein digestion or the regulation of cellular protein metabolism, neither blood nor urinary analysis in such meat intoxication has yielded the final answer as to the precise nature of these processes or even the specific substances responsible for the symptoms of intoxication. The intoxication does not appear to be due to ammonia.

III. RELATION OF THE LIVER TO CARBOHYDRATE METABOLISM

Since the fundamental discovery of Claude Bernard of glycogen storage in the liver, a great amount of work has centered on this problem, particularly in relation to hypoglycemia and hyperglycemia, diabetes mellitus, and various forms of glycosuria. The possible direct nervous control of this phase of liver function has also been investigated with, at present, indecisive results. Particularly noteworthy are the facts that in severe diabetes mellitus or experimental diabetes following total extirpation of the pancreas, the liver cells practically lose their ability to store glycogen despite the high sugar content of the blood. This type of liver failure may be present without any evidence of serious impairment of other liver functions. The fact that the liver can again store glycogen on administration of the pancreatic hormone, insulin, is an illustration of reciprocal dependence of the liver cells on hormones or substances produced in other organs of the body. There are indications in the experimental literature of similar dependence of the normal detoxicating processes of the liver on hormones from the parathyroid glands, although in this case the data are by no means as direct or as conclusive as in the case of dependence of the liver cells on the pancreas hormone for normal storage of glycogen. The glycogen storage rôle of the liver cells is, of course, shared by the muscle tissue and other tissues of the body, although the recent work of Mann on liver extirpation seems to show that after total loss of the liver the animal completely loses its ability to regulate the level of the blood sugar. This is an important fact that only the liver extirpation method

could have yielded. This regulation does not seem to depend on the quantity of glycogen in the liver, although when liver glycogen is present this source of glycogen is also used to mobilize blood sugar in hypoglycemia. Evidently, the liver produces some substance other than sugar necessary for the correlation of the blood sugar and tissue sugar; or else in the absence of the liver, toxic substances developed in the blood and the tissues upset the normal mechanism serving to maintain a fairly regular level of blood sugar, even under extreme conditions of carbohydrate ingestion or sugar utilization by muscular work. The same fact is indicated by Eck fistula dogs after chronic protein intoxication in which we have a progressive liver degeneration and persistent hypoglycemia (S. A. Matthews). The liver seems to be the main, if not the only, organ capable of forming glycogen from fructose and galactose.

IV. THE RELATION OF THE LIVER TO FAT METABOLISM

This problem is at present not well worked out. Direct chemical analysis of fats found in the liver, at least under certain conditions, seems to show that the liver desaturates fats. This has been interpreted as proving that the liver in this way prepares the fat for oxidation in other tissues, but it is still an open question whether other tissues besides the liver do not also have the faculty of desaturating and thus directly oxidizing fats. A curious and interesting relation seems to obtain between glycogen storage and fat storage in the liver in that when liver glycogen is diminished fat storage is increased.

V. BILE FORMATION

The formation of bile by the liver appears to be a process both of excretion and of secretion. Apparently the bile pigment can be to a large extent formed in tissues outside the liver. It is probably also formed in the liver itself, since the liver is one of the main sites of final solution of the erythrocytes; but on the basis of recent work by Mann and his associates, we must assume for the present that as regards the bile pigment the liver acts mainly as an excretory organ, and this view is in harmony with the well known fact that jaundice may appear as a result of an excess rate of hemolysis when there is no obstruction at all in the bile passages and, therefore, a free flow of bile from the liver into the intestines. Under these conditions it is obvious that the production of bile pigment from liberated hemoglobin exceeds the excretory capacity of the liver and hence some of the symptoms of jaundice. The bile salts, or rather the bile acids, appear to be specifically synthesized in the liver; hence these are true secretory products of liver activity. The liver, like other tissues, probably has the power to form cholesterin; the cholesterin of the bile may therefore be partly an excretory and partly a secretory function, depending on the activity of the liver cells. The excretory rôle of the liver is further indicated by the great number of substances artificially introduced into the body which appears in the bile. Some of these substances are at the same time excreted by the kidneys; others, again, like tetrachlorphenolphthalein, appear to be exclusively excreted by the liver. This phase of liver action has been extensively exploited in recent years with the view of developing reliable clinical tests of the liver functions. It must be noted that such tests touch only the excretory capacity of the liver. They do not touch the other fundamental liver processes, and one must be careful in drawing conclusions as to liver function on the basis of excretory tests alone, in view of the fact that some functions of the liver may be impaired at the same time that others seem to be relatively unimpaired.

VI. FUNCTIONS OF THE GALLBLADDER

The gallbladder seems to be an anomaly, since it is absent completely in some mammals and it can be extirpated in man and the experimental animal without any demonstrable influence on liver function or bile formation. It is definitely demonstrated that the bile in the gallbladder is concentrated; that is, there is considerable water absorption. Apparently some mucin is added to the bile in the gallbladder. The gallbladder itself is feebly contractile by virtue of the small amount of muscle tissue in its wall. We must remember that the entire liver, including the gallbladder and the duct system, is a diverticulum of the intestine, and we must therefore expect some remnants in structure and function in the duct system from this original intestinal anlage.

Bile is continually produced by the normal liver even in the fasting man and animals, and it continues to flow into the intestine provided there is no obstruction to the duct system, even during prolonged fasting. I feel that the rôle of the gallbladder as the storage organ for bile has been greatly exaggerated, and many textbooks of physiology err when they state that bile does not enter the intestine except during digestion. The inference from such a statement is that bile secreted during fasting is stored in the gallbladder. The gallbladder is not of sufficient size for such storage, even though considerable absorption of water from the bile takes place in that organ.

Any one working on large numbers of laboratory animals must be struck with the relatively uniform size of this organ at necropsy. We find in general the same content of bladder bile in the same species of animal irrespective of whether the animal is at the height of digestion or in a prolonged fast. The secretory pressure of bile is relatively low. Various figures are given by different observers. It is further reported that the secretory pressure of bile is lower than the normal tonus of the so-called sphincter of Oddi, a system of smooth muscle fibers at the entrance of the bile duct into the lumen of the duodenum. The resistance to the flow of bile into the duodenum is probably determined more by the tonus of the muscle wall of the duodenum than by the tonus of the so-called sphincter of Oddi, since the bile duct runs for some distance obliquely through this muscle layer. The state of tonus or periodic contractions of the duodenum must therefore be of importance in the flow of bile into the intestines, irrespective of any contractile power of the gallbladder or secretory pressure in the liver itself. Food in the stomach and intestines leads to increased secretion of bile. Hydrochloric acid or acid gastric juice in the duodenum leads to increased flow of bile. Since there is a continuous secretion of more or less acid gastric juice into the stomach, even in fasting, we have at least one mechanism that may play a rôle in the continuous production of bile by the fasting liver, although, of course, continued destruction of erythrocytes as well as the continuous absorption of bile acid from the intestine are additional mechanisms. There is indisputable evidence that the bile salts themselves are true cholagogues. It is also

true that the "secretin" of Bayliss and Starling, when injected intravenously, causes some increase in the secretion of bile; but it is at present doubtful whether this secretin in the sense that Bayliss and Starling used the term is a normal mechanism either for pancreas or for liver secretion. Aside from foods, acid gastric juice, the bile salts or whole bile, there are at present no definitely demonstrated cholagogues. This is a curious commentary on numerous kinds of "liver pills" and "liver remedies" that have grown so luxuriantly from time to time in the hothouse of therapy. It has been shown that part of the increased bile production in the response to foods is due to the absorption of substances from the alimentary canal rather than to the reflex action, since bile secretion in response to a meal is decreased in the Eck fistula dog, in which the portal blood is shunted into the general circulation and only a small fraction of the digestive products thus comes into contact with the liver through the hepatic artery.

VII. RELATION OF THE NERVOUS SYSTEM TO LIVER FUNCTION AND BILE EVACUATION

The relation of the nervous system to liver function and bile evacuation forms an interesting and challenging chapter in the literature on liver function in health and disease. Most of the problems remain at present incompletely solved. The following statements may be briefly made:

1. Section of both vagi and both pairs of splanchnic nerves induces no demonstrable change in liver function or in evacuation of bile into the intestines. This seems to show that the extrinsic nerves connecting the liver and the bile systems with the central nervous system are not necessary in normal liver process. In this respect we find a parallel in the normal function of the stomach and intestines after complete denervation. Conclusive as these experiments seem, they do not permit the corollary that the nerves connecting the liver and the bile system with the central nervous system play no rôle in normal or abnormal liver functions.

2. The famous "puncture" experiments of Claude Bernard, that is, injury to the medulla leading to hyperglycemia from rapid liberation of liver glycogen, have been abundantly confirmed but not yet completely analyzed. Macleod has reported the following facts: (*a*) Stimulation of the peripheral end of the splanchnic nerve causes liberation of liver glycogen. The same stimulation, after previous excision of the suprarenals on the same side, does not produce excess liberation of the liver glycogen.

(*b*) Stimulation of the splanchnic nerves after section of the hepatic plexus also fails to produce liberation of liver glycogen. Hence, splanchnic nerve stimulation apparently does not produce hyperglycemia by liberation of epinephrin. However, stimulation of the splanchnic nerve peripheral to the suprarenal produces hyperglycemia when the suprarenals are intact, but not when they are extirpated. Macleod therefore concludes that the splanchnic nerves contain true glycogen fibers to the liver, but that the action of these nerve fibers on the liver cells depends on something given off to the blood by the suprarenals. This phase of the problem requires further investigation before even these conclusions can be accepted.

3. Cannon and his co-workers have reported that stimulation of the hepatic nerves liberates something in the blood which has a direct stimulative action on the denervated heart. This is particularly true, according to Cannon, when the experiment is made on the animal at the height of digesting a protein meal. In regard to most of the present experiments on the rôle of the hepatic nerves in liver function, it must be noted that it is extremely difficult to isolate the effect of vasomotor changes in the liver due to such stimulation from the possible effects of other types of nerve fibers in the same nerve trunk on the hepatic cells direct, since many of the liver functions, notably the storage of glycogen, are sensitive to the hydrogen ion concentration, which, of course, is quickly changed by liver vasoconstriction.

4. As regards the extrinsic nerve control of the contractions of the gallbladder and the musculature of the bile passages, and particularly the sphincter of Oddi, there are few fields in experimental physiology in which so much serious work has been done with so few conclusive results. In crucial experiments one may obtain a feeble contraction of the gallbladder on the stimulation of the peripheral end of the cut vagi. Investigators have also reported that this stimulation causes relaxation of the sphincter of Oddi, and that stimulation of the peripheral end of the cut splanchnic nerves, on the other hand, causes relaxation of the tonus of the gallbladder and contraction of the sphincter of Oddi. Equally competent observers have failed to obtain the latter results.

Now, from the fact that both vagi and the splanchnic systems send motor as well as inhibitory fibers both to the gastric and possibly to the duodenal musculature, it is highly probable that this original primitive nerve supply is also present in the gallbladder and hepatic duct system. The fact, however, that no disturbance follows section of these nerves seems to show that it is of no fundamental or primary importance in health, and that reflexes of prime importance involving the gallbladder and duct system are local, as in the case of the coordination of gastric and intestinal motility.

5. When food or acid gastric juice enters the duodenum, duodenal motility is initiated or augmented both by local and by long reflexes, and increased secretion is produced in the stomach, pancreas and liver. Some increased tonus may be induced both in the gallbladder and in the duct system, and these, aided by peristalsis of the duodenum and by increased secretory pressure of bile, probably account for the copious flow of bile into the intestine parallel with digestion.

6. The practical aspect of this question has been emphasized in the last few years by the introduction of the so-called Meltzer-Lyon method of nonsurgical drainage of the gallbladder. This method assumes that on the introduction of magnesium sulphate directly into the duodenum by means of the duodenal tube there follows relaxation of the sphincter of Oddi and contraction of the gallbladder, and hence a drainage of the bile from the gallbladder and duct system to a degree not produced by foods, water or gastric juice in the duodenum, or by magnesium sulphate given by mouth. I have seen no satisfactory data proving these assumptions, and I question them in toto on the basis of what is known concerning the physiology of the liver, the duodenum and the liver excreting systems.

I have no right to and I do not propose to question the reports of the effects on patients of this therapy, but I should like to see controls and statistics like those that we require in the therapies of other diseases. What is the natural history of the maladies in which this drainage has been used? It has been used in migraine, in nausea, in undernutrition and in many

gastro-intestinal disorders of obscure etiology and uncertain duration. What is the average duration of these maladies in the absence of duodenal drainage? We cannot establish facts or reliable therapies in this or any other field by the ordinary testimonial method. Magnesium sulphate is, of course, an old and well known stimulant to intestinal peristalsis and defecation. When introduced into the duodenum, some of it will escape down into the small intestine and the large bowel, even though attempts are made to drain the duodenum after a minute or two. I cannot see that the clinical results reported can possibly be due either to the drainage of the gallbladder or to drainage of the liver and the pancreas, or even to evacuation of some of the bile by way of the duodenal tube, as I know no evidence proving that this bile is injurious when left in the intestines.

MODIFIED PHYSIOLOGIC PROCESSES FOLLOWING TOTAL REMOVAL OF THE LIVER *

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The physiologic changes that occur when the liver is extirpated have been studied for several years in our laboratories. In this paper I shall present briefly a general review of the results of our experiments on the changes in physiologic processes produced by the sudden and complete removal of the liver, and discuss them in relation to the functions of the liver. Although a great many changes have been observed, data concerning the modification of carbohydrate metabolism, protein metabolism and the major constituents of the bile mainly will be presented.

Several different species of animals have been employed in the experiments, such as the goose, the duck, the frog, the turtle and the fish. While the general effects of hepatectomy have been the same in all species of animals, the variation probably depending on the difference in metabolism of the various species, I shall emphasize the results as obtained in the dog.

The method employed for removal of the liver in the dog, as well as the procedure necessary for maintaining the animal in good normal appearance and physiologic condition, has been presented. In this connection it should be noted that the success of these studies of the effect of total removal of the liver has been due to two factors: (1) the development of a method for total removal of the liver which is comparatively free from complications and does not impair the venous return from the viscera and lower extremities, and (2) the discovery that a certain level of blood sugar is necessary to maintain life, that normally the liver maintains this level, and, finally, that following removal of the liver the blood sugar level could be maintained artifically by the administration of correct amounts of glucose. By the proper utilization of these two principles, a dog could be maintained in a normal appearing condition for many hours after the loss of the liver. This furnished an opportunity to observe the changes in physiologic processes produced by the sudden loss of hepatic function over a period of several hours in an animal appearing no different from any other animal that has been subjected to etherization and operation. As a review of the pertinent literature on the subject has been given in other papers, it will not be presented here.

MODIFICATION OF CARBOHYDRATE METABOLISM FOLLOWING REMOVAL OF THE LIVER

Removal of the liver completely severs a part of the vital normal process of carbohydrate metabolism. Immediately after removal of the liver the animal appears normal for several hours, but the blood sugar level begins progressively to fall. When it reaches a certain rather definite level, a characteristic group of symptoms develops; they usually occur in an order paralleling the decrease in concentration of sugar in the blood. If glucose is injected in proper amounts when the animal is in the moribund condition associated with the low blood sugar, there is an immediate return to normal. After a period of time, which in general depends on the amount of glucose injected, the blood sugar again becomes low, the characteristic symptoms develop and injection of glucose restores to normal. This process can be repeated many times with the same result, although usually progressively increasing amounts of glucose are necessary to maintain the blood sugar above the hypoglycemic level. Finally, however, another group of symptoms develops, entirely different from those occurring when the blood sugar is low, and the animal dies, regardless of the amount of glucose administered. Thus far it has not been possible to determine the cause for the second group of symptoms and the resulting death. If glucose is administered before the blood sugar has decreased to a low level, the characteristic symptoms associated with the hypoglycemia do not develop.

Many substances were administered to the moribund hepatectomized animal to determine whether the curative effect of glucose was specific or whether other substances would replace it. No other was found except a few other sugars which are readily converted into glucose in the blood stream. Other substances that might possibly be substituted for glucose or converted into glucose, if sufficient time were given for such changes to take place, were tried by administering them in suitable and comparable amounts immediately after removal of the liver. The blood sugar and the condition of the animal were carefully observed to determine whether the decrease in blood sugar and the development of the symptoms were delayed. Among the substances thus employed were glycocoll, lactic acid, and levulose. None of these substances produced any effect when the animal was in the moribund condition. Nor did glycocoll or lactic acid produce any effect when injected at frequent intervals immediately after removal of the liver until the animal was moribund. The progressive fall in the blood sugar level, and the time after removal of the liver at which the hypoglycemic condition developed, were not in any way affected. It was possible to keep the hepatectomized animal alive, but not in a normal appearing condition, by the injection of levulose, beginning the injections immediately after operation. It was necessary to administer the levulose more frequently and in larger amounts than the glucose, and the animal did not exhibit the same general well being as when glucose was used. Furthermore, levulose maintained life for a shorter time.

It is not necessary to describe here the characteristic group of symptoms that occur in association with the

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low blood sugar following hepatectomy and the strikingly beneficial effect produced by the injection of glucose in the moribund condition of hypoglycemia, not only because such a description was given somewhat in detail in the first articles, but also because, with the recent discovery of insulin, it was soon found that an almost identical hypoglycemic condition could be produced with it as had been produced in hepatectomized dogs.

In this connection it might be well to state that our observations support the idea that these characteristic symptoms are directly dependent on the hypoglycemia. Furthermore, while no explanation of the cause of the hypoglycemia after hepatectomy can be given at present, it is certain that at least part of the lost glucose is used for the maintenance of metabolism, and in all probability the symptoms of hypoglycemia are directly due to the loss of the available foodstuff.

After it had been found that the liver was necessary to the maintenance of the normal blood sugar level, it seemed desirable to know whether it was also responsible for producing the increases in blood sugar. The hyperglycemic conditions can be divided into two types: (1) the more or less permanently sustained hyperglycemia that follows the removal of the pancreas, and (2) the transitory hyperglycemia that follows states of asphyxia, excitement or operative trauma, and the administration of certain drugs, such as epinephrin.

The effect of hepatectomy was studied at various periods after pancreatectomy. If the liver and pancreas are removed at the same time, no different result is observed than when the liver alone is removed. If the liver is removed after definite and marked hyperglycemia has occurred following pancreatectomy, the blood sugar decreases seemingly more precipitately than in the normal hepatectomized dog, and the characteristic hypoglycemic symptoms develop. Usually such symptoms occur at a much higher blood sugar level if the pancreas has been removed some hours previous to the removal of the liver than if only the liver has been removed. The beneficial effect of glucose is very transitory in the hypoglycemic, pancreatectomized animal.

The effect of hepatectomy on the transitory hyperglycemia produced by anesthesia and operation, asphyxia and epinephrin was investigated. In no instance did an increase in blood sugar occur following these procedures in a hepatectomized animal. As a matter of fact, it was not possible to produce an increase in blood sugar in a hepatectomized animal except by the administration of glucose or related sugars.

The glycogen content of the muscle of the hepatectomized animals was found to decrease while the blood sugar was decreasing. However, the muscle glycogen rarely decreased more than 50 per cent. between the time of operation and the beginning of the moribund period. Furthermore, there was always an amount of glycogen in the muscles when the animal was moribund which, if it had been converted into glucose and added to the blood stream, would have been sufficient to maintain the blood sugar considerably longer. If, after an animal has been moribund, glucose is injected in amounts sufficient to keep the blood sugar above normal, the muscle glycogen will increase after a few hours, and there may be more than before the liver was removed. Muscle glycogen may also be increased in the hepatectomized animal by the injection of lactic acid and levulose.

As hepatectomy so greatly alters the metabolism, it was desirable to determine whether the respiratory quotient and total heat production were affected by the loss of the liver. It was also hoped that these studies might furnish some clue to what happened to the glucose that disappeared after hepatectomy. Accordingly, animals prepared for removal of the liver were trained for the basal metabolism observation. After fairly constant results had been obtained with regard to the respiratory quotient and total heat production, as well as the effect of the intravenous injection of various amounts of glucose on the same factors, the liver was removed. Observations were made on the metabolism of the hepatectomized dog during the normal period after operation, when hypoglycemic and moribund, and during the recovery after the injection of glucose.

This series of experiments was very difficult, and there were many possible sources of error which could not be wholly eliminated. The data at present do not justify definite conclusions. It can be stated, however, that the respiratory quotient appears to increase after removal of the liver and that the total heat production decreases as the animal becomes hypoglycemic. Both the respiratory quotient and the total heat production increase after the intravenous injection of glucose, and the response is seemingly more marked in the hepatectomized animal than in the normal animal.

MODIFICATION OF PROTEIN METABOLISM BY REMOVAL OF THE LIVER

Estimations of the importance of the liver in relation to protein metabolism and the various nitrogenous constitutents of the blood vary. Certain observers consider that this organ is very important to protein metabolism and that it is the sole source of some of these nitrogenous constituents; others deny that the liver has anything more to do with protein metabolism and the function of these nitrogen constiuents than any other tissue of the body.

Experiments showed that protein metabolism is greatly modified by removal of the liver. They definitely proved that the liver has a great deal to do with the metabolism of this major foodstuff and the origin of some of the nitrogenous constituents of the blood. The manner by which removal of the liver affects protein metabolism can be best illustrated by a separate consideration of the effect of hepatectomy on the various nitrogenous constituents of the blood.

The urea content of the blood following removal of the liver depends entirely on the amount excreted from the body. If the kidneys are removed at the same time as the liver, or if the animal becomes anuric after hepatectomy, the urea content of the blood remains the same or falls slightly below its preoperative level. The decrease noted in such experiments can be accounted for by the amount lost in the saliva and vomitus. If the secretion of urine is maintained after hepatectomy, there is a marked decrease, not only in the urea content of the blood, but also in the amount eliminated through the urine and in the urea content of the tissues of the body, as the muscles. If the kidneys are removed from eight to twenty-four hours before the liver is removed, so that at the time of hepatectomy the blood urea level is far above normal, no further increase in blood urea takes place. The urea found in the blood and tissues and excreted after operation accounts for all the urea present at the time of operation. These results conclusively prove that the production of urea absolutely ceases after removal of the liver.

Normally, the dog does not show more than a trace of uric acid in the blood or excrete uric acid in any appreciable amount in the urine, as this nitrogenous constituent is further oxidized to allantoin. After removal of the liver, uric acid appears in the blood, and concomitantly, a great amount will be excreted in the urine. The amount of urates excreted in the urine of a hepatectomized dog is often so great that about half the volume is a heavy flocculent precipitate, and so concentrated that crystals form almost immediately after the urine is voided. Uric acid injected into the normal dog is very quickly destroyed. Uric acid injected into the hepatectomized dog may be almost entirely recovered in the urine, or, if the kidneys are removed, the injected uric acid will approximately all be found in the muscles and blood. These experiments prove conclusively that the destruction of uric acid in the normal dog depends on the presence of the liver, since the destruction ceases as soon as the liver is removed. They suggest that the liver in man may be of considerable importance in the metabolism of the purins.

Removal of the liver is followed by a progressive increase in the amino-acid content of the blood. If the kidneys are removed at the same time as the liver, the amino-acids increase more rapidly in the blood. One amino-acid, glycocoll, has been injected intravenously to determine whether it would in any measure take the place of glucose, either in preventing the development of the hypoglycemic symptoms or in restoring the animal to normal after they had developed. Glycocoll never produced any beneficial action. It would thus seem that it could not in any measure take the place of glucose in the hepatectomized animal. There was never any evidence of the formation of urea following the injection of amino-acids into the hepatectomized animal. These observations, taken as a whole, would imply that the normal mechanism for the utilization of amino-acids is probably destroyed by the removal of the liver.

The changes in the blood creatinin after removal of the liver depend entirely on the kidneys. If the kidneys are active, the blood creatinin does not change. If the kidneys are removed as well, or the animal becomes anuric, the creatinin increases in the blood at the same rate as when only the kidneys are removed. The creatin behaves in a similar manner. The liver would therefore appear to take no specific part in the creatinin-creatin metabolism.

The result of experiments on the effect of removing the liver on the formation of ammonia are not entirely satisfactory. There is a shift in the relation of urea and ammonia nitrogen in the urine, with a relative increase in ammonia nitrogen compared to the decrease in urea nitrogen. There does not appear to be an increase in the total amount of ammonia in the urine or in the tissue. The liver probably does not have any special part in the production of ammonia.

THE CONSTITUENTS OF THE BILE AFTER REMOVAL OF THE LIVER

Bile production is probably the best known and one of the most important functions of the liver. The bile is composed of several substances, of which bilirubin, the bile salts and cholesterol are considered the most important. One of the most debated questions concerning the action of the liver has been whether it is responsible for elaborating these three important constituents of the bile or whether they are formed elsewhere in the body and merely excreted by the liver. Estimating the amount of these substances in the blood before and at various times after hepatectomy offered an excellent method of studying this problem.

The results of experiments are very definite as regards bilirubin. This important constituent of the bile can be formed in tissues other than the liver. A yellow color has consistently developed in the urine, plasma and fatty tissue of all hepatectomized animals living more than six hours. The yellow in the urine is usually observed in the first specimen secreted after operation. In from three to six hours after removal of the liver, the plasma becomes tinged with yellow, which usually increases progressively until death. A yellow tinge also develops in the sclerotics of the animals that live sixteen hours or more after operation, and can be sometimes seen in the mucous membranes as well. At necropsy all the fatty tissue is a dirty yellow. This yellow pigment, wherever found, was positive for bilirubin in all the chemical tests employed, including all those that are generally accepted.

The accepted chemical tests for bilirubin are not considered absolutely specific, since a few other substances will give a positive reaction. These substances, however, are not normal constituents of the blood. It would seem, therefore, that while the possibility does exist that a substance other than bilirubin might occur in the blood which would give the bilirubin reaction, the chemical identification of the pigment is practically definite. The possibility must also be considered that there may be substances intermediate between hemoglobin and bile pigment, as found in the bile, which would give a positive chemical test for bilirubin. It is possible that these intermediary substances could be formed outside the liver, but that the elaboration of the pigment in its final form goes on only in the liver. All observations were opposed to these views and tended to prove that the pigment which accumulated in the hepatectomized dog was the same as the pigment found in the bile. As all the accepted chemical tests gave a positive reaction for bilirubin with the pigment in the blood of the hepatectomized animals, only the physical methods of identification of the pigment remained. Through the cooperation of Sheard of the Section on Physics the pigment was tested in the only other known manner; namely, by determining the curve of its light transmission. The liver was removed from one dog, and the gallbladder was removed and the common bile duct ligated in another dog. When the plasma had become markedly yellow in each animal, about eighteen hours after operation, specimens of plasma from each dog were given to Sheard to determine the curve of light transmission with the spectrophotometer. The curves obtained from the two pigments were identical. This would seem to add the final evidence that the pigment which develops in the hepatectomized animal is bilirubin.

The possible sources of the pigment were carefully investigated. As the liver was totally removed, the possibility of remaining liver tissue having caused the production of the pigment need not be considered. That the pigment was not squeezed from the liver at the time of operation is proved by its absence from the plasma immediately after operation, by its progressive increase and by the failure of careful clamping of the vena cava before hepatectomy to prevent its occurrence. That it was not just the result of the absorption of bile from the intestine which had been discharged previous to hepatectomy is proved by the failure of resection of the gastro-intestinal tract at the

time of hepatectomy to prevent its occurrence, and by the disappearance of pigment from the contents of the gastro-intestinal tract within a few hours after hepatectomy, while the pigment in the plasma increased progressively. That it had not just been stored in some organ previous to hepatectomy is evident, since the amount in the urine and the amount found in the plasma and tissues at death was too large to have been stored in any one organ or tissue without giving marked evidence of its existence. As the pigment appears in animals in which both the liver and spleen are removed, the latter organ is clearly not necessary for its formation. Furthermore, it appears when no blood is present in the peritoneal or any other serous cavity, so that the cells lining these cavities are not essential to its production.

The results of our experiments, therefore, show conclusively that after removal of the liver, a pigment accumulates in the body, which in all its characteristics, chemical and physical, appears to be bilirubin and which is made by some organ or tissue without the intervention of the liver. This proves definitely that the liver is not essential to the formation of bilirubin. At least a portion of the bile pigment can be produced outside the liver, and to some extent the liver must be considered an excretory organ so far as this constituent of the bile is concerned.

The effect of extirpation of the liver on the incidence of the other two important constituents of the bile, the bile salts and cholesterol, in the blood was not so clearly demonstrated. Estimations of the cholesterol of the blood before, and at various periods after, removal of the liver did not show any significant changes. These results do not permit the drawing of conclusions in regard to the relationship of the liver to this substance. They might be interpreted as showing that cholesterol is made by the liver and that when this organ is removed no change in the blood content would occur because its utilization is so slow. On the other hand, they might mean that the liver merely excretes cholesterol after it has been made elsewhere in the body but that the rate of its production over its utilization and excretion is too slow to produce a measurable increase in the blood during the experiments.

Data on the relationship of the liver to the formation of bile salts are also inconclusive. Present chemical methods are not sufficiently delicate to determine the accumulation of bile salts in the blood following the obstruction of the common bile duct during the period the hepatectomized animal is kept alive. It would therefore seem impossible to hope to obtain results in the hepatectomized animal until a more delicate method of detection and estimation of bile salts in the blood has been elaborated. We have, however, obtained positive Pettenkofer's tests for bile acids in dialysates of plasma obtained several hours after the liver was removed in dogs whose dialyzed plasma gave no tests for bile acids before operation.

THE PHYSIOLOGIC SIGNIFICANCE OF THE MODIFIED PHYSIOLOGIC PROCESSES FOLLOWING TOTAL REMOVAL OF THE LIVER

Conclusions must be drawn cautiously with regard to the function of an organ, when they are based on a study of the effect of its removal. It is always quite possible that many of the results following removal may be secondary and not directly related to the activity of the organ in question. However, many of the results of the effect of hepatectomy have been so definite and their significance so clear that conclusions are justified.

Many other changes observed after hepatectomy require confirmatory data before conclusions can be drawn.

Certain functions of the liver would appear to be clearly defined. The liver is functioning at all times to maintain the normal blood sugar level. Furthermore, the production of the permanent and transitory condition of hyperglycemia, not due to the administration of carbohydrate, depends on the liver. The liver is not only the storehouse for carbohydrates and the seat of the mechanism whereby a fairly constant blood sugar level is maintained, but it probably also has the ability to make glucose from other available sources. This predominant and responsible position of the liver with regard to maintaining the blood sugar level under varying conditions and employing, when necessary, a variety of materials, suggests also a necessary and more or less specific relation to protein metabolism. Thus urea formation ceases and the amino-acids increase after removal of the liver. The organ also has an important share in the metabolism of the purins.

The glycogen mechanism of the muscle is probably of little importance with regard to the general blood sugar content. It would appear that the glycogen in the liver acts as a reservoir from which the liver can maintain a fairly constant level of blood sugar under varying conditions of absorption of carbohydrate and utilization of glucose, while the glycogen in the muscles is mainly for the purpose of muscular metabolism. The liver to some extent is but an excretory organ as regards bile pigment.

SUMMARY

The blood sugar decreases from the instant the liver is removed. Muscle glycogen decreases concomitantly. When the blood sugar falls to a certain level the characteristic symptoms associated with low blood sugar appear, and if glucose is not administered, the animal will die in a condition of hypoglycemia. The proper administration of glucose prevents the hypoglycemia and the development of the characteristic symptoms, and prolongs the life of the animal many hours until a different condition develops and the animal dies. The cause of death in the latter condition has not been determined. The action of glucose in the hypoglycemic condition is specific. The decrease in blood sugar following hepatectomy also occurs in the condition of hyperglycemia that follows extirpation of the pancreas. The transitory hyperglycemia that follows the administration of epinephrin, production of asphyxia and similar procedures does not occur after hepatectomy. An animal will die following the development of hypoglycemia with a considerable amount of glycogen still present in the muscles. If the blood sugar level is maintained above normal in the hepatectomized animal, muscle glycogen will increase. Urea formation ceases immediately after removal of the liver. The amino-acids, which normally would have entered into the process of urea formation, accumulate in the blood and, if the kidneys are active, are excreted in the urine. Uric acid is not destroyed, and it actually accumulates in the blood and tissues or is excreted in the urine if renal activity is maintained. A yellow pigment accumulates in the hepatectomized animal which gives a positive reaction to the accepted chemical tests for bilirubin as well as produces the same curve of light transmission, with the spectrophotometer, as bilirubin.

THE CLINICAL USE OF TESTS FOR HEPATIC FUNCTION *

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The recent advances in physiology and biochemistry are responsible for a renewed emphasis on the functional changes accompanying disease of the different organs. The development of rapid and simple methods of blood analysis, in particular, has contributed largely toward this end.

The most widespread and striking applications of functional tests to clinical medicine have been made in the study of renal diseases. The kidney is preponderantly an excretory organ and, consequently, peculiarly suitable for functional study. Both the initial material, the blood, and the excretory product, the urine, are readily available for analysis. In consequence, tests of renal function are widely used and their value, especially that of the determination of the blood urea and the excretion of phenolsulphonephthalein, is firmly established.

The clinical study of the activities of the liver is much more difficult, for it is an organ with manifold functions, and detailed knowledge of some of its normal physiologic activities is extremely inadequate. The liver is chiefly concerned with the blood borne to it by the portal vein; this blood comes from the abdominal viscera and may contain many substances not present in the general circulation. The bile cannot be directly collected for study, and the material obtained by duodenal drainage may be mixed with an unknown amount of intestinal content. Therefore, the approach to the functional study of the liver must be indirect and correspondingly difficult.

Many tests for the various individual activities of the liver have been devised. Some are of doubtful value; others have interesting possibilities and promise to be useful to the clinician.

During the last two years, I have been making a comparative study of the more promising of these tests in an effort to determine their place in clinical medicine. Through the cooperation of the Mayo Clinic staff it has been possible to study patients with hepatic disease from the medical, surgical, pathologic and physiologic aspects, as well as from the laboratory point of view. A series of more than 700 cases has been thoroughly studied in this way.[1] At this time, it will be possible to indicate the more important conclusions.

GENERAL METABOLIC ACTIVITIES OF THE LIVER

Carbohydrate Metabolism.—Since the time of Claude Bernard, the importance of the liver in relation to the storing of glycogen and the regulation of the blood sugar has been manifest. Many attempts have been made to demonstrate changes in the glycogenic activity of the liver. Fructose has been the sugar most commonly used for this purpose. A diminished ability on the part of the organism to utilize this sugar, as evidenced by its appearance in the urine or by an undue increase in the amount in the blood following the administration of fructose, has been thought to indicate functional inefficiency of the liver.

It can be shown experimentally that a diminished fructose tolerance follows toxic injury to the liver by phosphorus, chloroform or hydrazin. A similar reduction in fructose tolerance following experimental ligation of the common bile duct has been observed by investigators.

The clinical application of such experimental findings is difficult. Numerous factors, such as pancreatic, pituitary or other endocrine disorders, influence the ability of the organism to metabolize carbohydrates. The clinical use of the original test devised by Strauss has generally been abandoned. We have used the more recent modification recommended by MacLean and de Wesselow, and studied the change in the blood sugar following fructose administration. We have not been able to show specific changes that could be definitely ascribed to hepatic damage alone. In general, we believe that while tests of fructose tolerance may be valuable from an experimental standpoint, they are of questionable importance in the diagnosis and treatment of the individual patient.

Protein Metabolism.—The liver is known to be the seat of much of the intermediary nitrogen metabolism in the body. Frerichs was one of the first to recognize the importance of crystals of the amino-acids, leucin and tyrosin in the urine of patients with acute yellow atrophy. During the last two decades, much has been written concerning the urinary nitrogen partition in hepatic disease. Rowntree, Marshall and Chesney emphasized the difficulty of interpretation in such studies, and called attention to the accompanying changes in the blood; they found that the proportion of blood urea was slightly decreased in hepatic disease. More recently, Bollman, Mann and Magath have reported evidence pointing to a cessation of urea formation in dogs after complete extirpation of the liver. In our experimental animals with obstructive jaundice, there was usually a sharp and definite decrease in both the relative and absolute values of the blood urea. These low values persisted until shortly before the death of the animal, when a terminal rise of blood urea occurred. This probably was evidence of terminal renal insufficiency.

Clinical experience has not demonstrated a significant departure from the normal in the blood urea. In patients with jaundice, the average value for the blood urea apparently is slightly lower than in those without jaundice, but the change is not sufficiently marked to be of diagnostic importance. In the dog, urea formation ceases after the complete removal of the liver. In man, a comparable degree of hepatic insufficiency is not observed, even with the grossest hepatic changes.

Following operation for the relief of obstruction of the biliary tract, patients not infrequently become extremely toxic. This condition is accompanied by increasing jaundice and a rise in the blood urea, even though the output of urine is maintained. Impairment of one function of the liver, such as that of bile excretion, is not necessarily paralleled by changes in the other physiologic activities. This fact indicates the necessity in the functional study of the liver of employing a diversity of tests that will include the multiple activities of that organ. Mention should be made of

* From the Division of Medicine, Mayo Clinic and the Mayo Foundation.

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1. Greene, C. H.; Snell, A. M., and Walters, Waltman: Clinical and Experimental Studies in Diseases of the Liver, I, A Survey of Tests for Hepatic Function, Arch. Int. Med. **36**: 248-272 (Aug.) 1925. Snell, A. M.; Greene, C. H., and Rowntree, L. G.: II, A Comparative Study of Certain Tests for Hepatic Function in Experimental Obstructive Jaundice, ibid. **36**: 273-291 (Aug.) 1925. Greene, C. H.; McVicar, C. S.; Rowntree, L. G., and Walters, Waltman: III, A Comparative Study of Certain Tests for Hepatic Function in Patients with Obstructive Jaundice, ibid. **36**: 418-436 (Sept.) 1925.

the strikingly beneficial action of the intravenous administration of glucose in combating this toxemia.

In the dog, the liver is directly concerned with the metabolism of uric acid which accumulates in the blood following hepatectomy; in man, no noteworthy change in the amount of uric acid or other nonprotein nitrogenous constituents of the blood has been observed in hepatic disease.

FORMATION AND EXCRETION OF BILE

Bile Pigments.—Since the most striking hepatic disorders are those accompanied by the retention of bile and consequent jaundice, much attention has been paid to the presence and source of bile pigments in the blood, urine and feces. Mann's experiments have finally and conclusively proved the contention of Whipple and Hooper that bile pigment may be formed outside the liver and excreted by that organ. Obstructive, hemolytic and hepatogenous types of jaundice must each be recognized as possible from a physiologic point of view.

A century ago, Tiedeman and Gmelin reported the presence of bile pigment in the blood of a patient with obstructive jaundice. Gmelin's test is classic and, until the last few years, was the standard method for the recognition and study of the bile pigments. Recently, van den Bergh has devised a quantitative and more sensitive test for bile pigments. This method has made it possible to study the bile pigment or bilirubin content of the blood serum in patients with jaundice. The test is important from both the physiologic standpoint and that of clinical usefulness; it is quite as important to study the serum bilirubin in hepatic disease as it is to measure the blood urea in renal disease. Bilirubin cannot be shown by the van den Bergh test to be normally present in the serum of the dog. Following ligation of the common bile duct, it appears in increasing amounts, although large quantities are not found until forty-eight hours or more after operation. If the gallbladder is removed at the time the common duct is ligated, bilirubin appears in the serum much more rapidly, and large amounts are found within from twelve to twenty-four hours. After the preliminary rise, the bilirubin content of the serum is quite constant during the period of obstruction. In all cases, the appearance of clinical signs of icterus follows the increase in the pigment content of the blood.

The study of the serum bilirubin is of equal clinical usefulness: (1) in estimating the degree of retention of bile in patients with obstructive jaundice; (2) in furnishing a quantitative index for the degree of jaundice observed in the various toxic or infectious types; (3) in following the course of jaundice due to any cause, and (4) in demonstrating the presence of latent icterus.

In connection with latent icterus, a number of concrete diagnostic applications may be mentioned. In pneumonia, exophthalmic goiter, the toxemias of pregnancy, or following the administration of chloroform or arsphenamin, high bilirubin values predict the onset of toxic icterus with its important prognostic import. In heart disease, emphysema or arterial hypertension, rising levels of serum bilirubin foreshadow passive congestion of the liver as the result of myocardial failure. In secondary anemias, except those of hemolytic origin, normal bilirubin values are the rule. For example, in differentiating occult carcinoma and pernicious anemia, a high figure would argue for the latter diagnosis provided metastasis to the liver could be excluded. However, in the presence of carcinoma, elevation of the bilirubin value indicates involvement of the liver or biliary passages.

Determinations of the serum bilirubin are most valuable in the differential diagnosis of cases of abdominal colic. As pointed out by Blalock, less than a third of all biliary colic is followed by manifest icterus. In the remainder, not associated with jaundice, diagnosis may be extremely difficult. Following biliary colic, the serum bilirubin is elevated, although not always to a degree or for a length of time sufficient to color the skin or sclerotics. In such cases, the demonstration of latent icterus is diagnostic. We have also seen a few acute cases of severe but unlocalized abdominal pain, in which the finding of serum bilirubin in amounts considerably above the normal has served to establish the diagnosis.

Bile Salts.—Hemolytic jaundice is probably associated with bilirubinemia, or the presence of bile pigments in the blood. In obstructive jaundice, on the other hand, we are dealing with a condition in which bile is absorbed and both bile pigments and bile salts are present in the blood. The possibility of a dissociated jaundice, in which there is an accumulation solely of bile salts in the blood, has long been discussed, particularly by French clinicians. This problem can be solved only by quantitative studies, and so far, there has been no adequate clinical method for the study of metabolism of bile salts. A method for the quantitative study of the bile salts in the blood has been greatly needed. Such a method has recently been developed in our laboratory. It promises to be very useful, and it is hoped that it may aid in establishing the relation of bile salts to hepatic disease.

An increase in the ultramicroscopic fat particles or hemoconia in the serum after a fat meal has been used by Brulé as an index to the presence of bile salts in the intestine. This normal increase does not occur with biliary obstruction. It is obvious that this test gives results roughly comparable to an examination of the stools for bile, and the French clinicians have emphasized its value in determining the presence or absence of obstruction of the common duct. The clinical and experimental studies in the Mayo Clinic have, in general, been confirmatory.

DETOXICATION IN THE BODY

The body possesses a truly remarkable ability to detoxify many poisonous compounds. The conjugation of benzoic acid with glycocoll to form hippuric acid, or the excretion of camphor as camphor glycuronate, are examples of this detoxifying activity that has been ascribed to the liver. As yet, however, there has been no thoroughly satisfactory means for measuring the detoxifying power of the body. More recent experiments indicate that it is not entirely confined to the liver.

Widal has suggested that the liver removes and destroys toxic products of cleavage of the protein which are present in the portal blood, the so-called proteopexic activity. In the presence of hepatic disease, these products enter the general circulation, and a temporary leukopenia or hemoclastic crisis is produced. Widal has utilized the hemoclastic crisis as a test for hepatic function. This test has been employed both clinically and experimentally in the Mayo Clinic, but its diagnostic value has not yet been established.

The delay in the coagulation time of the blood in cases of obstructive jaundice is too well known to

require special comment. The value of calcium chlorid intravenously, as a preoperative measure to prevent later hemorrhage, has been amply demonstrated.

EXCRETION OF DYES

Many dyes when injected intravenously are excreted wholly or in part through the bile. Phenoltetrachlorphthalein, rose bengal, methylene blue and mercurochrome-200 soluble are examples. Tetrabromphenolphthalein and tetra-iodophenolphthalein have been used to permit the roentgenographic delineation of the gallbladder. Others have been used as tests of hepatic function. I shall consider only phenoltetrachlorphthalein, as it was the first to be introduced and has been the most thoroughly studied. The value of the different substitutes is yet to be finally established.

When the phenoltetrachlorphthalein test was originally introduced into clinical medicine by Rowntree, Hurwitz and Bloomfield, the attempt was made to measure its excretion in the stools. This work established the specificity of the dye excretion by the liver, and demonstrated the possibilities of employing the method as a functional test. Whipple, Peightal and Clark established its value in experimental injuries of the liver. Later, the method of collecting bile by a duodenal tube was substituted. Neither was wholly satisfactory for routine clinical use. Rosenthal introduced the study of the rate at which the dye left the blood stream. In hepatic disorders, the rate of dye removal is greatly reduced. It is the clinical use of this modified test, the Rowntree-Rosenthal test, that I shall discuss.

The technic of the test is simple. The solution of the dye may be obtained in ampules. One cubic centimeter of this solution is injected intravenously for each 10 kg. of body weight. Fifteen minutes, one hour, and two hours later, blood samples are taken, 5 c.c. at each time being ample. The clear serum is separated, a drop of alkali is added to bring out the color of the dye, and comparison is then made with standard tubes. Normally, the dye is rapidly removed from the blood stream. At the end of fifteen minutes, only from 5 to 7 per cent. remains, while at the end of an hour, only traces of dye are present. In patients with obstructive jaundice, as much as 30 per cent. of the dye may still be present in the blood stream two hours after the injection.

To secure an experimental background for the interpretation of clinical findings, we have studied the changes observed in the elimination of phenoltetrachlorphthalein after the ligation of the common bile duct in dogs. Bile is retained in such animals, the time at which jaundice appears depending on the presence or absence of the gallbladder. These dogs have a progressively increasing degree of dye retention which is found to be parallel to the increase in the serum bilirubin.

The changes observed in man are quite similar. A series of cases of obstructive jaundice due to stone or postoperative stricture of the common bile duct have been studied. Cases of cholecystitis without jaundice showed only the slightest degree of dye retention. With the development of jaundice, the changes in elimination of phenoltetrachlorphthalein became definite and characteristic. In all cases, there was marked retention of dye in the blood stream. As in dogs with experimental obstruction of the common bile duct, the degree of dye retention roughly corresponded to the degree of retention of bile pigment.

Following the operative relief of the obstruction in these patients, there was a rapid decrease in the amount of serum bilirubin and in the degree of dye retention. The serum bilirubin speedily returned to normal. Following the first decrease, however, the phenoltetrachlorphthalein test often showed a moderate but persistent retention of dye. Possibly this is related to the residual hepatitis observed in nearly all patients who have suffered from biliary obstruction for any extended period.

The changes observed in the other clinical varieties of icterus were quite similar to those seen in obstructive jaundice. In acute infectious or catarrhal icterus, in toxic jaundice, whether associated with syphilis and treatment by arsenicals or chloroform anesthesia, in pneumonia, exophthalmic goiter and in acute yellow atrophy of the liver, marked retention of dye is present. Again the degree of dye retention closely parallels the increase in the serum bilirubin. In such cases, icterus is the outstanding manifestation, and it dominates both the clinical picture and the laboratory findings.

The dye test, however, is of greatest clinical value in those cases of hepatic disease in which jaundice is not present. The obstetricians have applied the test in the differentiation of the toxemia of pregnancy from neurotic vomiting and eclampsia of nephritic origin. In the toxemia, the dye test will apparently indicate hepatic changes before the increase in serum bilirubin is established. In carcinoma of the gastro-intestinal tract, normal readings are obtained before extension of the growth begins. Moderate retention was found in a series of cases of carcinoma of the stomach or colon without jaundice, and the surgeon found obvious metastasis to the liver in most of them. The degree of retention of the dye depends, in part, on the extent of the malignant process in the liver, so that a normal test will not positively exclude the presence of small metastatic nodules there.

Definite changes can be shown in cirrhosis by means of the dye test, although the correlation of laboratory findings with the clinical picture must be made with care. The retention of dye has definite diagnostic value in biliary, syphilitic or portal cirrhosis.

The various functional tests contribute but little, from the standpoint of the differential diagnosis of hepatic diseases. This, perhaps, is to be expected, for experience with tests of renal function has likewise demonstrated that functional changes are not necessarily characteristic of the particular etiologic agent.

The liver is an organ with a large factor of safety, for a large proportion of it can be removed experimentally and the remnant will still suffice for normal function. Again, disturbance in one type of physiologic activity does not necessarily indicate commensurate disturbance in other functions of the liver. The presence of a normal amount of bilirubin in the serum and the absence of dye retention will not exclude hepatic disease. Positive tests, on the other hand, are of great value in indicating the probable presence of definite and widespread hepatic damage. Although the present hepatic functional tests are not ideal, their introduction is another milestone on the road to the better understanding of diseases of the liver.

[EDITORIAL NOTE.—This paper, together with the papers by Drs. Carlson and Mann, which precede it, and three papers, by Dr. Opie, by Drs. McClure and Mendenhall and Mildred Huntsinger and by Drs. Lyon and Swalm, respectively, to appear next week, are part of a symposium on "Liver Function." The discussion will follow the papers to be published in our next issue.]

THE CORRELATION OF FEDERAL HEALTH AGENCIES *

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Of the hundred or more major administrative units of the national government, at least thirty are concerned directly or indirectly with some phase of the public health. These bureaus or other divisions are scattered through the ten executive departments and the score or so of independent establishments of the United States. Generally speaking, they carry on their activities more or less independently. Of the thirty, only eight have a major and primary interest in public health, the others having a less significant relationship to the subject, for their health or medical activities are usually carried on as secondary to the general scope of the various bureaus.

The public health operations of the federal government were not established all at once, but have grown up by a process of political and administrative evolution extending over a long period of time. A brief historical statement showing the gradual development of these bureaus will be of interest and of value by indicating the manner in which the different departments have availed themselves of favorable opportunities to add health duties to their other functions.

The first important congressional enactment to deal with health was a law of 1798 that authorized collectors of customs to collect 20 cents a month from each American seaman on merchant ships arriving from foreign ports, in order that medical relief might be given to those needing it. Out of this activity grew the Marine Hospital Service, though it was not definitely organized as such until 1870. Many other duties, such as the administration of national quarantine laws, medical inspection of immigrants, and investigations of diseases were added to its responsibilities from time to time, and in 1902 the name of this service was changed to the Public Health and Marine Hospital Service. In the following years, Congress imposed on the service still other duties, more and more of a public health nature, so that in 1912 the name was again changed, this time to the Public Health Service. The many splendid achievements of the bureau, which is today the principal health agency of the federal government, are so well known to all members of the medical profession that there is no need to take the time to dwell on them. It will be noted that the Public Health Service is in the Treasury Department for historical reasons only. The collectors of customs of the same department now collect quarantine charges, inspect vessels for sanitary conditions, and regulate the importation of certain articles, such as meat and drugs, which must conform to certain standards of purity. The domestic regulation of narcotics is administered by the Bureau of Internal Revenue of the Treasury Department.

Except for the creation of a medical establishment in the army, which was authorized as early as 1798, the next medical agency of the government was the hospital for the insane, which was created in 1855 and is now under the Interior Department. In 1873 a medical and education division was set up by the Office of Indian Affairs, though it was in existence for only four years and was not revived as a unit until 1909. Investigations of animal diseases were authorized by Congress in 1878, and this work was gradually extended until 1884, when a Bureau of Animal Industry was established in the Department of Agriculture. Today, much of the operation of this important bureau touches on human health. Ten years later (1894), the Secretary of Agriculture was given an appropriation of $10,000 to conduct investigations in nutrition. At present there is a Bureau of Home Economics, which receives an appropriation of more than $100,000 annually in order to conduct these studies and other work relating to the home.

The collection of national vital statistics was authorized by an act of 1902 and placed under the supervision of the Bureau of the Census of the Department of Commerce. The Food and Drugs Act of 1906 imposed the carrying out of the necessary analytic work on the Bureau of Chemistry of the Department of Agriculture, and another law passed at the same time required the Bureau of Animal Industry to inspect all meat intended for shipment in interstate commerce. The control and licensing of biologic products, however, had been assigned to the Secretary of the Treasury by an act of 1902, and delegated by him to the Public Health Service.

From 1910 on, many other new bureaus with health interests have been created. In that year the Bureau of Mines was established in the Interior Department, and one of its main objectives was to conduct research to benefit the health and safety of miners. The Public Health Service was authorized to detail a medical officer to this bureau in 1917. Also in 1910, a division of school hygiene appeared in the Bureau of Education of the Interior Department. The Bureau of Education likewise has administered medical relief to the natives of Alaska since 1909. A Children's Bureau was created in the Department of Commerce and Labor in 1912, transferred to the Department of Labor in 1913, and its scope was much broadened in 1921, when the federal Maternity and Infancy Act was passed.

Among other bureaus that may be mentioned are the United States Employees Compensation Commission, organized in 1916 to give compensation and medical aid to injured federal employees; the Women's Bureau, established in the Department of Labor in 1920; the United States Veterans' Bureau, which came into being in 1921 to give medical care and vocational rehabilitation, among other things, to ex-service men; the federal Narcotics Control Board, formed in 1922 to administer the act prohibiting the importation of opium except for medicinal purposes; and, finally, the Bureau of Dairying, which was made a separate bureau in the Department of Agriculture in 1923, after having been a division of the Bureau of Animal Industry for many years. A detailed study of all these federal health activities is now being conducted under the auspices of the Institute for Government Research of Washington, D. C., by Mr. James A. Tobey, whose long experience as Washington representative and later secretary of the National Health Council has made him thoroughly conversant with these matters. No attempt has been made to enumerate each and every bureau having a health interest, and more detailed information may be secured by those interested directly from Mr. Tobey.

Proposals that these federal health activities should be effectively coordinated are not new. From 1910 to 1912, an intensive agitation was conducted throughout the country for a national bureau of health with a

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

secretary in the Cabinet. President Taft recommended such a bureau in two of his messages to Congress, and the American Medical Association passed a resolution indorsing the proposition, which was sponsored by the Committee of One Hundred of the American Association for the Advancement of Science. There was some precedent for such a bureau, for at one time the United States did have a national board of health. It was established by Congress in 1879 for a four year period. In 1882 its functions were restricted to the investigation of smallpox, cholera and yellow fever, but no appropriations were made to the board after 1885, and the act creating it was definitely repealed in 1893.

During the World War, President Wilson issued an executive order to the effect that all federal health work, except that conducted by the army and navy, and the industrial hygiene activities of the Bureau of Labor Statistics, should be exercised under the supervision and control of the Secretary of the Treasury, which meant, of course, the Public Health Service. After the war, it was proposed completely to reorganize all the executive departments. The plan that was finally recommended by a joint congressional committee, headed by a representative of President Harding, included a scheme for a new Department of Welfare. In the session of Congress that adjourned last March, this had become a Department of Education and Relief, the only health agency included in the proposed department, however, being the Public Health Service. For many reasons, this plan was thoroughly unsound, though the general reorganization idea contained some excellent provisions. Congress took no action on the matter. The Sixty-Ninth Congress will meet according to law on the first Monday of next December. It is to be hoped that a definite, practical plan, decided on by the medical and sanitary professions, and by experts in political science, agreeable to the bureau chiefs concerned, and with the support of the administration, may be presented to Congress for its approval.

The bureaus that may now be said to have a major interest in national health are: Public Health Service (Treasury); Children's Bureau (Labor); Division of Vital Statistics, Bureau of Census (Commerce); Bureau of Chemistry (Agriculture); Bureau of Home Economics (Agriculture); Bureau of Animal Industry (Agriculture); Division of School Hygiene, Bureau of Education (Interior); Medical Division, Office of Indian Affairs (Interior).

Any plan for the correlation of federal health work must take into consideration these bureaus, though whether all of them or parts of them should be combined in a new department is a matter to be determined only after a most careful study and the consideration of all the factors, administrative, legal and political which enter into the problem. Whatever seems to be the best plan, whether all these bureaus and divisions are brought together or not, there must be worked out some form of efficacious cooperation between them. This might be effected by having a medical liaison officer in any new arrangement that is decided on or by provisions for the assignment of medical and sanitary officers from a central bureau of health to other branches of the government carrying on health activities. At the present time, many of these bureaus are not entirely familiar with the work being done by the others. Though duplication may be more apparent than real, because the field is so vast and diversified, there is, nevertheless, some overlapping and there are also some unfilled gaps.

The promotion of national vitality is as important to the welfare of this country as is commerce, agriculture, industry, finance, foreign affairs, public works, or any other legitimate function of government. Most of these matters have been accorded the recognition due them by having a secretary in the President's Cabinet. The ideal condition would be likewise to have a secretary of public health. It is a question, however, whether it would be expedient at this time to advocate such an arrangement. There should be, however, some high official in charge of all major public health activities of the national government. He might be an assistant secretary for public health in some existing department or in a new one to be established in accordance with the general reorganization scheme, or he might be a commissioner of public health without a seat in the Cabinet, but in charge of an independent establishment. It is almost needless to remark that this officer should be a well qualified sanitarian.

SUMMARY

In this paper, an attempt has been made in a limited time to call attention to the present lack of correlation of federal health agencies, many of which, of course, are accomplishing very valuable and significant results. While making certain general suggestions for coordination, no recommendation for any definite plan is made, for such a suggestion would be premature. The subject will, however, be before the medical and sanitary professions for definite conclusions in the near future and a positive stand should then be taken. For the present, there is no doubt that in the interests of efficiency there must be practical coordination and that this should be brought about as soon as possible. The history of all worth-while social legislation indicates, however, that, no matter what its merits, it requires presentation to several congresses before such measures are finally adopted.

While the care of the public health in this country is, under our form of government, primarily vested in the individual states, the federal government does have certain proper duties, such as those involving foreign and domestic quarantine, interstate commerce, research, revenue matters, and the care of the health of the wards of the government. These duties can undoubtedly be more effective and can contribute more completely to the enhancement of national health and happiness, if they are conducted in a more unified way, thus supplementing the many notable achievements which these federal bureaus already have to their credit.

370 Seventh Avenue.

ABSTRACT OF DISCUSSION

DR. W. S. LEATHERS, Nashville, Tenn.: It is evident that during recent years there has been a definite tendency to reorganize the departments of the federal government with the object of preventing overlapping of functions, and also with a view of economizing public expenditures. In the consideration of federal health agencies there is not so much necessity for the rearrangement and transfer of governmental functions and agencies as the clear understanding of public health needs, the responsibility of the federal government in relation thereto, and additional funds to meet these needs. The equity in our form of government predicates as full autonomy as possible for state and local governments. The authority and duties of the respective state governments should be recognized in any readjustment or reorganization of federal health agencies. For a great many years there has been much discussion with reference to having a national department of health, with a secretary in the cabinet. I think that many of us who formerly were somewhat enthusi-

astic in this development have come to realize that at least for the present such a step is not advisable. The United States Public Health Service has been and should be the most important governmental agency in the prevention and control of disease and the promotion of the public health. The Public Health Service has, up to the present time, undergone steady and efficient development in the Treasury Department. It seems that this was the most practicable relationship for the health service because of the power and prestige of this department and relative independence enjoyed by the Public Health Service, and also because of its being unhampered by undesirable political considerations. Scientific research is the fundamental function of the federal government in relation to health conservation. It has been indicated that other problems of public health must of necessity devolve largely on state and local authorities, but investigation and research in the etiology and mode of transmission and methods employed in the control of disease and in the elevation of health standards is definitely a function of the federal health service. This does not mean that the Public Health Service and other federal agencies engaged in health work should not cooperate with and assist in every practicable way in the development of state and local health organizations; but there can be no question that the advancement of knowledge relating to health and disease is more distinctively a function of the federal government than the general promotion of public health. This, however, can be accomplished only provided proper facilities and highly trained scientists are available through a more adequate financial support. It seems to me that the outstanding need of the federal government is the bringing together under one roof of all facilities of the Public Health Service in the District of Columbia and their enlargement to meet the constantly increasing demands made on it.

DR. A. T. MCCORMACK, Louisville, Ky.: Those of us who are familiar with the splendid work being done by the Surgeon General of the United States Public Health Service appreciate particularly the efforts he has successfully made to have lists of officers, with all different activities in Washington compiled, but we realize, as he cannot, that to furnish lists of all the officers of federal bureaus and state health departments, some work has had to be done by other bureaus having relations with public health activities. I agree with Dr. Leathers that much has been accomplished under Dr. Cumming's supervision with so small a staff. We are able to be successful only when we have the charming personality of such a man as our Surgeon General. For many reasons our Public Health Service is outstanding and is recognized by foreign governments at present, but it seems to me of utmost importance that we have a system coordinated; that our scattered bureaus under health and education be permanently organized so that the Public Health Service furnishes not only the arterial system and brain, but in some way the vertebral column of public health, so that impulses that start at the head may go through the entire system in some reasonable degree of time.

DR. HAVEN EMERSON, New York: The members of this section do not need to be reminded that the American Medical Association through its former Council on Health and Public Instruction and through action of the Board of Trustees has in previous years supported efforts to have federal health activities coordinated, and it seems to me particularly timely that when the President of the United States has given his personal approval to studies designed to accomplish or prepare for adjustment and central direction of these government functions we should take advantage of that point of view, and assist so far as possible in this movement. I therefore offer the following resolution for consideration of this section:

Resolved, That the Section on Preventive Medicine and Public Health request the Board of Trustees of the American Medical Association to appoint a committee to cooperate with other groups, lay or professional, which may have as their objective the central direction of and responsibility for all the health activities of the federal government.

We must proceed conservatively and maintain the view that Dr. Williams has presented. I hope that the section will feel that it is not going beyond our province to express the attitude of the section in this way.

DR. GEORGE M. KOBER, Washington, D. C.: I second the resolution, because I believe that some action should be taken and the time is ripe, in view of the fact that Secretary Hoover has broken the ice in the way of consolidation and, in his own department, cooperation; he is a business man and does not believe in duplication and waste, and this will go a great way in helping the movement in which we are deeply interested. I was one of the Committee of One Hundred some fifteen years ago and it fell to my lot to present the first statement before the Senate and House congressional committees, and to educate our legislators in matters relating to preventive medicine. This education was not without results; the Public Health Service has assumed functions it has never attained before, and it seems to me that the time has arrived for a further expansion of national public health work.

DR. S. W. WELCH, Montgomery, Ala.: The remarks of Dr. Leathers were admirable. He expressed appropriately, clearly and positively the feelings of those of us who are actively engaged in public health work. It is a question which we should approach very carefully. I was in Washington last winter when the new welfare bill was under consideration. I do not think that any of us engaged in public health work approved of it. The educational people did not approve of it, and yet it was slated to pass. If it had not been caught in the jam of the Muscle Shoals bill, I think it would have been a law today. I do not think that we should ask Congress to give us a secretary in the cabinet at this time. If we could coordinate all the federal public health activities under one head, as suggested by Dr. Leathers, our difficulties might be solved. At one time I was very much in favor of a secretary of public health in the cabinet, but developments in the last few years have caused me to doubt the wisdom of it.

DR. LINSLY R. WILLIAMS, Albany, N. Y.: I have been very much interested to hear the suggestions made in regard to whether or not we should have a secretary at the head of a department of health. I recall very vividly discussing that matter with the secretary of the treasury during Mr. Taft's administration. Mr. McVeagh said to me at that time, "It would be perfectly feasible and proper to have a secretary for the promotion of health now, if it were not for the fact that we would have to have a department of labor as well, and it is not the policy of the government to increase the number of cabinet officers." I remarked to him that it was quite likely that they would have a department of labor any way, and so why not have a department of health also? As you know, the department of labor was not created then, but the Department of Commerce and Labor was, and subsequently it was divided into two departments. At the present time there is a determined movement to create a department of education, the name having been concealed in some way as a department of welfare or the like. Whether there will be a department of education and health, or whether a department of education alone seems to me immaterial; but there is one thing that does seem perfectly definite to those interested in this matter, who were in a measure responsible for Mr. Tobey starting on this study. That is that there must be a definite statement drawn up of functions of every individual bureau, that all these activities and all their preparations be put together into one definite report. Such a report must be printed and widely circulated. When that is done it will then be possible to think out not only what type of organization is really best, but what type of organization is feasible. Whether we have a commission or bureau or what not, it seems to me quite immaterial so long as we have what Dr. Leathers and Dr. McCormack and Dr. Welch have indicated, so long as we have a program of definite activities all under one roof. When that is accomplished I think we shall have gone a long way, whether we have a cabinet officer or not.

Summaries of Original Articles.—The *Archiv fár Schiffs- und Tropen-Hygiene, etc.*, has joined the constantly increasing list of those journals which demand that every original article shall be accompanied with a brief summary. Many of them now give summaries in two other languages, but only the Scandinavian *Acta* journals and some of the Japanese ban their own language completely throughout, and use only the three main congress languages.

MECHANISM OF THE ANTIEDEMIC ACTION OF EPINEPHRIN *

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Epinephrin is widely used against the phenomena of urticaria; the mechanism of this action seems not to have been solved. This question was therefore investigated in a study of the phenomena of wheal production from the intradermal injection of codein solution; such an injection of codein (0.15 c.c. of a 1:1,000 solution in saline solution) forms a wheal averaging about 1.3 cm. in diameter surrounded by a flushed area about 4 cm. in diameter, the reaction being practically indistinguishable from an urticarial lesion of similar size which often follows the injection of therapeutic serums. The reaction attains the maximum within from ten to fifteen minutes and has usually faded entirely in an hour or thereabouts. The edema of the wheal site is due to increased permeability of the minute skin vessels.[1] The experiments were made on a number of infants and children and the results are as follows:

An intramuscular injection of epinephrin (from 0.15 to 0.3 mg.) distinctly lessened the wheal formation of codein and hastened the absorption of the edema fluid, whether the epinephrin injection preceded the codein injection by two or three minutes, the two were given simultaneously, or the epinephrin was given two or three minutes after the codein injection.

SIMULTANEOUS INJECTIONS OF EPINEPHRIN AND CODEIN SOLUTIONS

When the reagents are injected in the same solution, a concentration of epinephrin of 1:10,000 had little if any primary effect on the codein (1:1,000) wheal formation but did somewhat hasten the disappearance time of the wheal. Even with epinephrin 1:1,000, the wheal reaction was not greatly modified. However, from ten to fifteen minutes after the mixed fluids were injected, a narrow border of blanching appeared about the wheal border and gradually the entire wheal area was blanched; this persisted the usual time for these dilutions of epinephrin (from two to four hours). Although epinephrin 1:100,000 blanches skin for an hour or longer, when given mixed with codein 1:1,000, no blanching at all appeared. Histamin 1:5,000 in epinephrin 1:10,000 solution gave results identical with codein.

CODEIN INTO EPINEPHRIN BLANCHED SKIN

When a codein injection was made into the center of an area of blanched skin 5 by 8 cm., a wheal 1 cm. in diameter was formed, considerably smaller than the normal and surrounded by a narrow flushed border; the disappearance time was shortened. With a blanched area 3 by 3 cm., the codein action broke through the partial epinephrin "block" at one border of the wheal, and the flush extended beyond the blanched area. When the codein phenomenon faded, the blanching of epinephrin returned and persisted for several hours. With more dilute epinephrin solutions, the effect was much less marked.

In view of the fact that the systemic action of epinephrin (from intramuscular injections) lessened codein wheal formation, although the concentration of epinephrin at the wheal site must have been very low, while the local action of epinephrin in high concentrations was slight, the effect of local injections of epinephrin in concentrations that caused no visible paling of the skin was investigated. It was considered possible that the local applications of such low concentrations of epinephrin might influence the codein action; such was not the case, however, for intradermal injections of epinephrin, one part in a billion (one part in one hundred million causes blanching), in no way modified the action of codein subsequently injected into the same site.

MECHANISM OF THE EPINEPHRIN ANTAGONISM

These observations show that epinephrin locally has very little or no effect on the wheal production unless it is injected in concentrations that actually arrest the local circulation; while the intramuscular injection decreases the wheal production very markedly, although the concentration of epinephrin is very much lower. This suggests that the antiedemic action of epinephrin is not a direct local effect, but that it is a secondary result of some unexplained systemic action. The existence of a systemic reaction with these doses of epinephrin was manifested in some cases by distinct pallor of the skin as a whole and by vomiting. Analogous antiedemic effects of epinephrin have been described for mustard-oil conjunctivitis,[2] for paraphenylendiamin [3] and clinically for various urticarias. Petersen, Levinson and Hughes [4] have discussed the effects of epinephrin on cell permeability, but their results do not appear to have been uniform.

CONCLUSION

The antiedemic action of epinephrin is due to a systemic and not a local action. The nature of the systemic action is not explained.

* From the Babies and Children's Hospital and the Department of Pediatrics of Lakeside Hospital and Western Reserve University.

1. Lewis, T., and Grant, R. T.: Heart **11**: 209 (May) 1924.

2. Hirschfelder, A. D.: Am. J. Physiol. **70**: 507 (Nov.) 1924.

3. Tainter, M. L., and Hanzlik, P. J.: J. Pharmacol. & Exper. Therap. **24**: 179 (Oct.) 1924.

4. Petersen, W. F.; Levinson, S. A., and Hughes, T. P.: J. Immunol. **8**: 323 (Sept.) 1923.

SYNERGISM OF MAGNESIUM SULPHATE AND MORPHIN AND MAGNESIUM SULPHATE AND ETHER *

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When anything new in medicine or surgery is proposed, it is natural and obvious that it will be criticized. Such criticism, to be of value, should be unbiased and accurate; otherwise, false and misleading statements occur.

In 1898, the late Samuel J. Meltzer of the Rockefeller Institute made the surprising discovery that 2 drops of a 5 per cent. solution of magnesium sulphate injected intracerebrally in a rabbit produced complete anesthesia and relaxation lasting several hours. In their first publication in 1905, Meltzer and Auer [1] made the general statement that the salts of magnesium are capable of inhibiting the entire nervous system, and assumed in particular that these salts are also capable of producing anesthesia and other inhibitory effects on the central nervous system. This first publication led to an extensive literature on the subject. Some of the writers insisted that magnesium exerts only a curare-like action; others criticized from other angles. Finally,

*A reply to an article by Beckman, Harry: The Alleged Synergism of Magnesium Sulphate and Morphin, J. A. M. A. **85**: 332 (Aug. 1) 1925.

1. Meltzer, S. J., and Auer, J.: Physiological and Pharmacological Studies of Magnesium Salts, I, General Anesthesia by Subcutaneous Injections, Am. J. Physiol. **14**: 366 (Oct.) 1905.

Meltzer and his co-workers established definitely the anesthetic properties of magnesium sulphate in both animal and man.

The synergism between magnesium sulphate and morphin was first observed in the laboratory by E. J. Pellini [2] of the University and Bellevue Hospital Medical College and immediately applied in the clinic, where its value was proved beyond question by trained observers.

The case presented in Table 1, from A. V. S. Lambert's [3] service of the Presbyterian Hospital, New York, illustrates the difference between magnesium sulphate and plain water when used with morphin.

From this protocol it may be concluded that when the magnesium sulphate (from 2 to 4 c.c. of a 25 per cent. chemically pure solution) is used with morphin, the value of the morphin is increased from 50 to 100 per cent. By either increasing or repeating the dose of morphin with sterile water, its action is intensified but not prolonged, as when used with magnesium sulphate.

Table 2, prepared from a number of cases selected at random from more than 200 similar cases at the Presbyterian Hospital, still further illustrates the synergism of morphin and magnesium sulphate as "occurring in man."

Table 3 gives a clean-cut picture of the comparative results obtained by Smythe [4] in 1922 and 1923, employing three hypodermic injections of one-eighth grain (8 mg.) of morphin dissolved in 2 c.c. of a 25 per cent. solution of magnesium sulphate, with 1/150 grain (0.4 mg.) of atropin added to the second dose, given at twenty minute intervals as a preliminary to nitrous oxid-oxygen and procain anesthesia for general opera-

TABLE 1.—*Case Illustrating Difference Between Magnesium Sulphate and Plain Water When Used with Morphin*

Badly lacerated wound of leg, gas infection, opened wide December 1; gastrocnemius severed.

December		Duration, Hours
2.	1: 15 a. m. Morphin, ⅓; $MgSO_4$, 2 c.c., 25 per cent.; quiet until 5	5¾
	6: 15 a. m. Morphin, 1/12; $MgSO_4$, 2 c.c., 25 per cent.; no pain all day	18
	The magnesium was now discontinued. Morphin alone used.	
3.	1: 30 p. m. Morphin, ⅓; pain in two hours	2
	3: 25 p. m. Morphin, ⅓; pain at 6: 40 p. m.	3¼
	The magnesium was again added to the morphin.	
	6: 55 p. m. Morphin, ⅓; $MgSO_4$, 25 per cent., 2 c.c.; no pain till next day	23
4.	5: 00 p. m. Morphin, 1/10; $MgSO_4$, 2 c.c., 25 per cent.; no pain till next a. m.	17
5.	10: 15 a. m. Morphin, 1/10; $MgSO_4$, 3 c.c., 25 per cent.; quiet all day	10
	8: 15 p. m. $MgSO_4$, 3 c.c.; very good night	19
6.	3: 50 p. m. $MgSO_4$, 3 c.c., 25 per cent.; severe pain after three hours	3
	6: 15 p. m. Morphin, ⅓; $MgSO_4$, 2 c.c., 25 per cent.; jerking of leg in two hours	2
	9: 15 p. m. Morphin, ⅓; $MgSO_4$, 2 c.c., 25 per cent.; quiet night	19
	The patient required one hypodermic of morphin, 1/12 to 1/6, and $MgSO_4$, 2 c.c., 25 per cent., each day after this until December 13. Codein and morphin alone did not give relief.	

TABLE 2.—*Synergism of Morphin and Magnesium Sulphate*

PATIENTS RECEIVING MAGNESIUM SULPHATE AND MORPHIN

No.	Operation	Time of Postoperative Sedative, Hours
1	Direct hernia	None
2	Double inguinal hernia	32
3	Carcinoma of rectum	29
4	Carcinoma of rectum	28
5	Acute appendicitis; general peritonitis	30
6	Incarcerated hernia	24
7	Chronic appendicitis	17
8	Acute appendicitis	13
9	Carcinoma of stomach	13
10	Ischiorectal abscess	12
11	Chronic appendicitis	12
12	Chronic appendicitis	12
13	Chronic appendicitis	10
14	Chronic appendicitis	5
15	Inguinal hernia	4
16	Lacerated wound of leg	3
	Total elapsed time	244
	Average time	16 hours, 16 min.

PARALLEL SERIES OF PATIENTS RECEIVING MORPHIN AND WATER ALONE

1	Ischiorectal abscess	None
2	Carcinoma of rectum	None
3	Hernia	15
4	Incarcerated hernia	10
5	Chronic appendicitis	3
6	Acute appendicitis	2
7	Chronic appendicitis	6
8	Double hernia	3½
9	Left inguinal hernia	3
10	Chronic appendicitis	2
11	Carcinoma of rectum	2
12	Chronic appendicitis	1½
13	Carcinoma of stomach	1
14	Acute appendicitis	½
	Total elapsed time	49¾
	Average time	4 hours, 6 min.

TABLE 3.—*Comparative Results Obtained by Smythe*

PATIENTS RECEIVING MAGNESIUM SULPHATE AND MORPHIN

No.	Operation	Time of Postoperative Sedative, Hours
1	Colpoperineorrhaphy	None
2	Appendectomy and cholecystectomy	None
3	Appendectomy	12
4	Appendectomy and cholecystectomy	3
5	Appendectomy	10
6	Perineorrhaphy	12
7	Cholecystectomy	16
8	Hysterectomy and double oophorectomy	9
9	Secondary closure	None
10	Nephrectomy	28
11	Hysterectomy	None
12	Perineorrhaphy, appendectomy, ventrosuspension	5
13	Appendectomy	None
14	Appendectomy	None
15	Appendectomy and cholecystectomy	24
16	Appendectomy and Cobelt's cyst	12
17	Radical breast amputation	None
18	Appendectomy and Schroeder's operation	12
19	Appendectomy	4
20	Schroeder's operation	None
21	Perineorrhaphy	4
22	Hysterectomy, colporrhaphy, perineorrhaphy	17
23	Appendectomy and cholecystectomy	12
24	Appendectomy and dilatation of cervix	None
25	Appendectomy and cholecystectomy	32
26	Separation of adhesions, omental graft under liver	6
27	Barrett's operation, separation of adhesions	36
	Total lapse of time before postoperative sedative	255
	Average lapse of time	15

PARALLEL SERIES OF CASES WITHOUT MAGNESIUM SULPHATE

1	Cholecystectomy	12
2	Cholecystectomy	8
3	Cholecystectomy	4
4	Cholecystectomy	2
5	Appendectomy	12
6	Appendectomy	3
7	Appendectomy	1
8	Appendectomy	None
9	Appendectomy	1
10	Drainage of appendix	2
11	Freeing stricture	2
12	Freeing stricture	1
13	Gastro-enterostomy, appendectomy	3
14	Freeing adhesions	12
15	Repair of hernia	2
16	Radical cure hernia	None
17	Herniotomy	11
18	Herniotomy	None
19	Removal of appendix, ovary, tubes and uterus	1
20	Hysterectomy	12
21	Hysterectomy	None
22	Hysterectomy	2
23	Hysterectomy	2
24	Hysterectomy	3
25	Hysterectomy	7
26	Cesarean section	4
27	Cesarean section	3
	Total lapse of time before postoperative sedative	110
	Average lapse of time	4+

2. Gwathmey, J. T.: Synergistic Colonic Analgesia, J. A. M. A. **76**: 222 (Jan. 22) 1921.

3. Gwathmey, J. T.: Anesthesia, New York, the Macmillan Company, 1924, pp. 640-665.

4. Smythe, F. D.: Further Experiences with Synergistic Analgesia, J. Tennessee M. A. **15**: 97 (June) 1922; Synergistic Analgesia, Am. J. Surg. (Anesthesia Supplement) **37**: 85 (July) 1923.

tions. One third of the patients thus prepared did not require an analgesic after operation. The table shows that the patients go on an average four times as long after an operation before an analgesic is required than patients who were given morphin dissolved in sterile water alone. Smythe states that the patient is neither frightened nor apprehensive concerning the operation or its outcome. The stage of induction is greatly shortened and there is rarely a period of excitement. The patient remains pink throughout the operation; the pulse rate rarely exceeds 90, generally varying from 80 to 84. The appetite returns earlier in patients operated on when magnesium sulphate had been employed because of the absence of pain and restlessness incident to the trauma inflicted at operation.

Harmon,[5] also has published accurate comparative data showing the synergism between magnesium sulphate and morphin occurring in man. He states that when the patient is given morphin in divided doses in magnesium sulphate solution prior to operation, there is a greater postoperative comfort, less nausea and vomiting; and a decreased amount of morphin is required.

Gwathmey,[6] in 1921, defined precisely the difference between the synergism of magnesium sulphate and morphin and the synergism between magnesium sulphate and ether: "It seems to act mechanically with morphin, holding it in contact with the tissues longer than the morphin can maintain such contact alone; but with ether the magnesium sulphate acts by deepening or increasing the effect rather than by prolonging it."

The synergism between magnesium sulphate and ether was demonstrated conclusively by Meltzer and Auer,[7] in 1913, when they observed that, after the intramuscular injection of one half or less of the anesthetic dose of magnesium sulphate, rabbits and dogs are readily and deeply anesthetized by inhalations of small doses of ether which are insufficient to anesthetize normal animals. In the experiments which they reported, rabbits were given 0.6 gm. (or less) and dogs 0.8 gm. (or less) of magnesium sulphate per kilogram. With these small doses the animals were only slightly affected; if ether was insufflated eight or ten minutes after such an injection, the animals became deeply anesthetized. The dose of ether that was sufficient to cause deep anesthesia was hardly a tenth of the dose that was otherwise required for a similar deep anesthesia without the help of magnesium sulphate. *By the administration of smaller doses of magnesium sulphate and ether, the first stage anesthesia was reached and maintained; that is, complete lack of sensation and the necessary general relaxation for all surgical procedures with the maintenance of special reflexes and without any peripheral paralysis.* Meltzer and Auer, in 1913, in collaboration with Peck and Elsberg, employed the combination clinically in seven cases. The patients were given from 0.4 to 0.6 gm. of magnesium sulphate per kilogram intramuscularly, which was less than half of the effective dose. The ether was administered by endotrachael insufflation. In no case did the patients retain a spark of consciousness even when the concentration of ether in the insufflation was about one sixth of the concentration usually employed. In all the cases there was complete relaxation of the muscles, and in no case was there even the slightest indication of pain while operations were being done in deep, sensitive places, as for example in radical breast amputations or radical removal of extensive, deeply located gland swellings in the neck and laparotomies with manipulation of the parietal peritoneum or gallbladder. With small doses of magnesium sulphate and very lightly maintained ether insufflation, there was often present a certain degree of lid reflex, even at times a spontaneous movement of the lids, without the slightest reaction to the operation on the part of the patient. In such cases the patient awoke shortly after the interruption of the administration of ether and the removal of the insufflation tube, but he could in no way remember the proceedings during the operation.

Gwathmey and Hooper,[8] in quantitative experiments, have found that the intravenous administration of less than one half the anesthetic dose of magnesium sulphate combined with approximately one ninth the anesthetic dose of ether produces surgical anesthesia without increasing the toxicity of the combination. A brief abstract of the experiments follows:

When 6 per cent. ether in physiologic sodium chlorid solution was injected into the internal saphenous vein of the albino rat, the average anesthetic dose was 744 mg. per kilogram, but the minimum lethal dose was over 2½ times 744, or 1,892 mg. per kilogram, indicating a wide margin of safety. When a 6 per cent. solution of magnesium sulphate was given, the same technic being used, the average anesthetic dose was 185 mg. per kilogram, and the average minimum lethal dose was 190 mg. per kilogram, showing a margin so narrow that it would be unsafe to use magnesium sulphate alone as a general anesthetic. If, however, a 6 per cent. ether and 6 per cent. magnesium sulphate solution in physiologic sodium chlorid solution is given, the average anesthetic dose is 170.8 mg. per kilogram, and the average minimum lethal dose is 344.4 mg. per kilogram; i. e., the lethal dose is more than twice the amount of the anesthetic dose, giving a wide margin of safety.

If this combined anesthetic dose, 170.8 mg. per kilogram (ether, 6 per cent.; magnesium sulphate, 6 per cent.) is analyzed, we get the result given in Table 4.

TABLE 4.—*Analysis of Combined Anesthetic Dose*

170.8 mg.	85.4 mg. ether equals 11.48 per cent. anesthetic dose ether alone (744 mg.).
	85.4 mg. $MgSO_4$ equals 46.16 per cent. anesthetic dose $MgSO_4$ alone (185 mg.).
Total, 57.64 per cent. of combined calculated anesthetic dose (296.32 mg.).	
Therapeutically, 11.48 + 46.16 equals 100 instead of 57.64 (definite synergism).	

The toxicity of ether and magnesium sulphate in combination is a simple summation of the toxicities of the two compounds, as shown in Table 5.

TABLE 5.—*Toxicity of Ether and Magnesium Sulphate in Combination*

344.4 mg.	172.2 mg. ether equals 9.1 per cent. M. L. D. ether alone (1,892 mg.).
	172.2 mg. $MgSO_4$ equals 90.6 per cent. M. L. D. $MgSO_4$ alone (190 mg.).
Total, 99.7 per cent. of combined calculated M. L. D. (345.4 mg.).	

From these results we may conclude that ether and magnesium sulphate act synergistically in producing anesthesia without producing any increase in toxicity.

5. Harmon, M. S.: Preoperative Narcotics, Current Researches in Anesthesia and Analgesia **4**: 15 (Feb.) 1925.

6. Gwathmey, J. T.: Current Progress in the Science and Practice of Anesthesia, J. A. M. A. **77**: 421 (Aug. 6) 1921.

7. Meltzer, S. J., and Auer, J.: Ueber die anästhetische und lähmende Wirkung von Magnesium unterstützt durch Aether, Zentralbl. f. Physiol. **27**: 632, 1913.

8. Gwathmey, J. T., and Hooper, C. W.: Synergistic Analgesia and Anesthesia with Special Reference to Magnesium Sulphate, Ether, Morphine and Novocaine, J. Lab. & Clin. Med. **10**: 641 (May) 1925.

Subcutaneous experiments with the albino rat demonstrated that the addition of 2.5 per cent. procain to the magnesium sulphate solution (50 per cent.) or to the magnesium sulphate solution with morphin increases the efficiency, definitely prolongs the effect, and allays irritation, without increasing toxicity. The synergism between magnesium sulphate and procain is definite because procain in itself produces no general analgesic action when injected subcutaneously in the albino rat. The addition of 2.5 per cent. procain increased the efficiency of the magnesium sulphate approximately 50 per cent. The combination of magnesium sulphate (50 per cent.) with procain (2.5 per cent.) may be a good substitute for morphin in general practice. A simple and convincing experiment for any physician is to compare the results produced on the same patient by an injection of one-eighth grain of morphin dissolved in sterile water with those produced with one-eighth grain of morphin dissolved in 2 c.c. of sterile magnesium sulphate solution (50 per cent.) with procain (2.5 per cent.).

If the addition of magnesium sulphate did no more than prolong the morphin effect it would be of great value to the anesthetist. The clinical effects, however, are of even greater importance.

1. The respirations of a patient receiving two or three injections of morphin (one-eighth grain) dissolved in 2 c.c. magnesium sulphate solution (50 per cent.) usually average twenty (normal).

2. The addition of the magnesium sulphate shortens the time of induction, gives a smoother anesthesia and decreases the amount of the anesthetic.

3. Postoperative nausea and vomiting is reduced and in many cases is completely abolished.

4. Wound and gas pains are more often absent and as a result convalescence is shorter and more agreeable.

5. The amount of postoperative morphin is reduced to a minimum.

6. When ether is employed as the anesthetic, the synergists save life. The following experiment is taken from a paper by Gwathmey and Hooper yet to be published: Four healthy albino rats were employed for each experiment. Two of the animals were given intramuscularly 0.8 c.c. per kilogram magnesium sulphate solution (50 per cent.) with procain (2.5 per cent.) and morphin (one-eighth grain in 2 c.c.). The other two animals served as controls and were not given anything. Ten minutes after the preliminary injections, all four animals were placed in the same gas chamber and given exactly the same ether vapor. The controls jumped around and struggled against the anesthetic and finally died within from eight to ten minutes. The synergized animals were anesthetized quickly and quietly and did not die within eight or ten minutes but survived the anesthetic for from twenty to twenty-five minutes. This experiment was repeated several times and always with the same results.

CONCLUSIONS

1. Satisfactory evidence is submitted to show that synergism between magnesium sulphate and morphin *does* occur in man. This evidence was in existence before the present discussion.

2. This synergism, with laboratory animals, is life saving when ether vapor is used as the anesthetic.

3. The synergism between magnesium sulphate and ether has been established for the albino rat, rabbit, dog and man. When properly applied the dose of ether sufficient to produce and maintain satisfactory anesthesia is reduced by one-half or more.

40 East Forty-First Street.

POSTENCEPHALITIC TIC OF THE DIAPHRAGM

PULMONARY OVERVENTILATION, AND RELIEF BY BLOCKADE OF PHRENIC NERVES *

C. J. GAMBLE, M.D.
O. H. PERRY PEPPER, M.D.
AND
G. P. MULLER, M.D.
PHILADELPHIA

This case deserves to be recorded not only because of its own clinical interest, but also because it exemplifies so well the modern method of coordinated team work in the study and treatment of an obscure case. The hospital records of the case include contributions from a variety of sources, each of help in arriving at the final diagnosis or in the treatment. Some might perhaps have been dispensed with and short cuts taken, but only at the expense of thoroughness and certainty.

REPORT OF CASE

A man, aged 38, of Polish birth, was primarily referred in March, 1925, by Dr. C. E. Ervin of the Geisinger Memorial Hospital of Danville, Pa., to Dr. C. H. Frazier in the surgical clinic of the University Hospital. The patient, in November, 1924, had had an illness which was probably acute epidemic encephalitis. The definite symptoms at that time had been pains in the head, back and extremities, with some weakness of the left hand and perhaps of the right side of the face. The hands had shown a tremor. The patient believed that he had been delirious for some little time but did not know how long. From this illness he slowly improved, until, Jan. 13, 1925, he first noticed some disturbances of respiration. He seemed to be breathing fast and hard, he said, and for comfort had to be propped up against several pillows. It was this disturbance of respiration which took him to the Geisinger Memorial Hospital and which led to their referring him to the University Hospital.

In March, under Dr. Frazier's care in the neurosurgical clinic, the patient was very carefully studied, and the following positive findings were discovered:

1. Vague hemianesthesia of the right side of the body.
2. Slight impairment of the seventh and eighth nerves.
3. Horizontal nystagmus. Left pupil negative to light, right pupil sluggish to light.
4. Spinal fluid pressure, 15 mm.
5. Negative Wassermann reaction.
6. Marked tachypnea, with no explanation for this in the examination of the heart or lungs. With each movement of the chest there was at times a slight partial closing of the left fist.

A careful laryngeal examination was performed by Dr. Gabriel Tucker, and no cause for the dyspnea was discovered. A thorough vestibular examination by Dr. Fischer revealed no symptoms of intracranial trouble. Roentgenologic examinations were made of the head for the pituitary fossa and for the sinuses and mastoid region, also of the chest. All of these were negative except for some clouding of the left mastoid. The surgical staff then referred the patient to the medical clinic for further study.

On examination in the medical clinic, it was noted that the patient was "dyspneic" and that the respiratory rate was 84 to the minute. However, he lay flat in bed and was not cyanotic. He complained of pain in the left arm from the shoulder to the elbow and of soreness of the right arm. He also was made very miserable by the distress which the disturbed breathing gave him.

The routine physical examination revealed little else than the findings already recorded, which were thought to be sequelae of the attack of encephalitis. A tremor of the

* From the Hospital of the University of Pennsylvania.

outstretched hands was present, especially on the left, and some ataxia and weakness of the left hand. The routine laboratory tests were all normal.

A careful study of the disturbance of breathing was made by one of us (C. J. G.), with pneumographic tracings taken of the chest and abdomen simultaneously. Apparently the following conclusions were justified:

1. The rapid chest movements which had been counted as respirations were slight excursions of the thorax which tended to follow the frequently repeated tic or spasm of the diaphragm. This tic occurred as a rule between 60 and 90 times a minute. It was not synchronous with the heart rate. The chest appeared to drop a beat occasionally, so that its frequency of expansion was slightly below that of the diaphragm.

2. Under conditions requiring increased ventilation such as immediately following a prolonged holding of the breath, the thoracic excursion fell into an exact 2 to 1 rhythm, an inspiration following immediately after every second tic. This condition was also observed on numerous occasions while the patient slept. It was also present throughout one day while the patient was awake. No cause could be discovered for the change in this rhythm or for the return to the more usual one on the succeeding day. The slower respiration was accompanied by greater subjective comfort and a more normal blood analysis, as shown in the accompanying table.

3. Holding the breath abolished the movements of the chest, but the tic continued without change. Neither morphin sulphate, one-third grain (0.02 gm.), nor scopolamin or atropin had any effect on the tic.

4. When, under the fluoroscope, the patient was instructed to take a deep breath, the diaphragm could be seen moving in inspiration and expiration, with the more frequent minor contractions of the tic superadded to the larger excursion. When the breathing was not voluntarily controlled, the only motion of the diaphragm was the tic.

It was suggested that the diaphragmatic tic might be producing sufficient pulmonary ventilation to render normal respiratory movements unnecessary. Studies were therefore requested of the department of research medicine to reveal whether this hypothesis was tenable, and were carried out by Dr. J. Harold Austin, the head of that department:

Two specimens of blood were analyzed, one taken when the chest movements were at the rate of 70 per minute, the second when the rate of the coarser movements was 36 per minute, although the tic was at its usual rate.

Results of Blood Analysis

	March 20 Respiratory Rate 70	March 27 Respiratory Rate 36	Normal
Carbon dioxid of venous serum (corrected for oxygen unsaturation)	57 per cent. by volume	62 per cent. by volume	40-60 per cent. by volume
p_H of arterial blood.....	7.55	7.43	7.3-7.5
Carbon dioxid tension of arterial blood	18 mm.	40 mm.	35-45 mm.

These figures reveal a shift of the reaction of the blood toward the alkaline side, in this instance in all probability due to the pulmonary overventilation with the excessive blowing off of carbon dioxid, which is evident from the conspicuous lowering of the carbon dioxid tension, and the fact that if the blood of the first date had been saturated at 40 mm. carbon dioxid tension, its serum would have had approximately the p_H and carbon dioxid content of the second specimen. Such a change in the reaction of the blood might be expected to result in the elimination of alkali in the urine as a compensatory or balancing mechanism. The urine of this patient was therefore examined and found to be alkaline to litmus and to have a p_H of 7.3, which is a shift well toward the alkaline side (the normal range of urinary p_H being from 5.0 to 7.5).

These studies confirmed the view that there was overventilation going on as a result of the tic with the synchronous and rapid respiratory movements. The respiratory center was not receiving normal stimuli to respiration and was not sending out strong rhythmic impulses. It seemed possible that there was no actual damage of the respiratory center itself, as might be feared after encephalitis (postencephalitic respiratory syndrome), but that the respiratory disturbance was wholly secondary to the overventilation induced by the diaphragmatic tic. If this were so, an abolishment of the tic should restore the breathing to normal.

In postencephalitic singultus (epidemic hiccup), relief has been obtained by blockage of the phrenic nerves by injection of procain or alcohol, or by freezing the nerves or even by their section. This apparently radical procedure does not disable the diaphragm as much as might be anticipated at first, perhaps because of the innervation of the peripheral part of the diaphragm by the intercostal nerves. The similarity of the present case to one of epidemic hiccup and the patient's distress seemed to justify the suggestion that blockage of the phrenic nerves be attempted.

Consultations were therefore requested with Dr. William G. Spiller, professor of neurology, and with Dr. G. P. Muller of the surgical service. Dr. Spiller agreed with the diagnosis of encephalitis as the basis for the trouble, but was not enthusiastic over the nerve blockage, probably believing that this was but one of several results of the encephalitis and that the tendency of such lesions was to be progressive. Dr. Muller gave the opinion that the blocking of the phrenic nerves could be easily performed, and with little danger. The patient was therefore transferred back to the surgical service for operation.

April 4, Dr. G. P. Muller performed the following operation: Through a small incision on each side of the neck, the phrenic nerve was exposed and frozen with ethyl chlorid spray. The incisions were closed without drainage. During the operation it was noted that the respiratory rate fell from 96 per minute to 20 per minute. A fuller report of this case from its surgical aspects will be made later by Dr. Muller in connection with other observations on the diaphragm.

At once on recovering from the ether anesthesia, the patient expressed his delight at his relief from respiratory distress, and this relief has persisted to date (October 27), a period of almost seven months.

Tracings taken by Dr. Gamble now showed normal respiratory movements, and in the fluoroscope the diaphragmatic movements could not be distinguished from those of a normal person with a small excursion. No tic could be observed. The breathing was apparently normal in every way. The respiratory rate was never rapid. When the breath was held the chest was entirely quiet and none of the jerky movements, which the tic had formerly caused, could be seen. There was no dyspnea or discomfort after climbing three flights of stairs in thirty seconds. No chemical studies were made after the operation.

The patient expressed himself as so much relieved and so comfortable that he insisted on leaving the hospital with the avowed intention of going back to work. He was allowed to leave after being warned that the relief might prove transitory, for it is known that freezing abolishes nerve function for only six to ten months, after which period the tic may return.

COMMENT

It is apparent that the relief given this patient was merely symptomatic and perhaps only temporary, and that it will have little or no effect on the course of the disease. On the other hand, the patient did obtain great comfort, and a complete relief from the symptom which was his chief complaint, and a return to economic usefulness. This was well worth while.

The correct analysis of this case depended primarily on the recognition that the so-called rapid breathing was not due to frequent normal respiratory movements but to definitely abnormal spasmodic contractions of the diaphragm. Once this observation was confirmed by fluoroscopic examination and by pneumographic tracings, it was possible to test the correctness of our hypothesis by chemical analysis of the blood and urine. With this added evidence we were justified in taking a

step, which at first glance might seem very radical, but the safety of which had been proved and for which there was good anatomic and physiologic basis.

Skill and technic were required to perform the delicate surgical operation and the special examinations reported above. It is only by such cooperative investigation that the best results, in many cases, can be obtained; and the present report, as was said at the outset, is submitted not only because the case is rare and interesting, but because it illustrates a successful application of intensive cooperative investigation.

Clinical Notes, Suggestions, and New Instruments

FISH LINE SUTURES

GEORGE F. CHANDLER, M.D., KINGSTON, N. Y.

For the last two years, I have been using ordinary "Starling" braided silk black fish line for all skin sutures and for all conditions, such as retention sutures in the perineum, which have been commonly made with silk or silkworm gut. Every surgeon to whom I have suggested it and who has used it is enthusiastic.

Silk swells continuously under moisture of the tissues and therefore is hard to remove, usually causing pain. Silk-worm gut cuts the tissue. Linen shrinks and allows the skin coccus to enter alongside the suture, frequently causing stitch abscess.

It occurred to me that the makers of fish line must have developed a structure that would act well in moisture. Experience has taught that boiling makes no difference with the line, and that it can be boiled and boiled again without harm or change. The large size of this suture makes it possible to support the skin incision, if it is used as a chain suture, with very few perforations of the needle. Six or eight locked sutures in an abdominal incision are enough, and they can be removed with absolute ease on the tenth day, leaving a very beautiful scar. Also, time can be saved in closure.

The moderate cost of this line, or suture, is another advantage. At the Kingston City Hospital, we buy it in boxes containing 100 yards each, at a cost of between 2 and 3 cents a yard. We use the Swastika brand, Size 5 F, but this is not necessarily the only one that may be suitable.

11 East Chestnut Street.

DRAINAGE OF THE GALLBLADDER

CHARLES W. MOOTS, M.D., TOLEDO, OHIO

As the technic presented here has never come to the notice of myself or my local friends, it may be of interest to the profession generally. I have used it in cases demanding drainage of the gallbladder when the much preferred operation of cholecystectomy was frankly contraindicated.

A man, aged 44, with a typical history of attacks of gallstone colic, was operated on, Aug. 20, 1925, at Mercy Hospital. When the abdomen was opened, the gallbladder looked and felt healthy, except that it contained five stones. The appendix was found to be in a state of subacute inflammation. What was more serious was the finding of the entire pancreas fully 50 per cent. increased in size, the surface being smooth, however.

The latter finding decided against removal of the gallbladder, and after the stones were removed, it was drained with three-fourths inch rubber tube, well held in by two rows of chromic catgut in such a manner as to turn the serosa against the tube. The appendix was then removed, and the wound closed. The patient was in a good condition; the systolic blood pressure was 120; diastolic, 80.

The patient did well for forty hours, at which time emesis began and recurred from every ten to fifteen minutes for the following twenty-four hours, when his condition became alarming, and the usual treatments failed to give relief. The emesis always had some bile, and finally had a fecal odor. There was great abdominal distention. I tested out the patency of the rubber drainage tube, gallbladder, cystic duct and common duct by slowly and carefully injecting, by means of a glass syringe, a warm boric acid solution through these structures. The patient was able to tell me when the solution reached the duodenum.

I then placed in the glass syringe a 2 ounce (60 c.c.) saturated solution of magnesium sulphate and slowly injected all of it into the duodenum through the drainage tube, gallbladder, cystic duct and common duct. Within forty-five minutes, the patient had a copious, watery stool, with evacuation of much gas, and was at once relieved of all bad symptoms, being able to take fluids freely. He slept all night, with no other medication. The following morning his condition was good, but the same treatment was repeated in order to watch the results. Another free movement of the bowels occurred, followed by a feeling of well being, which continued until his departure for home sixteen days later.

The following precautions are advisable:

(*a*) One should make sure that there can be no leaking about the tubing where it is stitched into the gallbladder.

(*b*) It should be ascertained whether there is any formidable obstruction in the cystic or the common duct.

2485 Collingwood Avenue.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

ARSPHENAMINE-D. R. L. (See New and Nonofficial Remedies, 1925, p. 47).

The following dosage forms have been accepted:

Arsphenamine-D. R. L., 0.3 Gm. Ampules.
Arsphenamine-D. R. L., 0.5 Gm. Ampules.

NEOARSPHENAMINE-D. R. L. (See New and Nonofficial Remedies, 1925, p. 49).

The following dosage form has been accepted:

Neoarsphenamine-D. R. L., 0.15 Gm. Ampules.

SCARLET FEVER STREPTOCOCCUS ANTITOXIN (See THE JOURNAL, May 2, 1925, p. 1338).

Lederle Antitoxin Laboratories, New York.

Scarlet Fever Streptococcus Antitoxin-Lederle (Refined and Concentrated).—It is prepared by immunizing horses by the subcutaneous injection of the toxic filtrate obtained by growing the scarlet fever streptococcus in broth; also by injecting cultures of the scarlet fever streptococcus. The serum is concentrated by a method similar to the Gibson-Banzhaf method. Each cubic centimeter neutralizes at least 50,000 skin test doses of scarlet fever toxin.

Marketed in packages of one syringe containing 1 Cc. (prophylactic dose); and in packages of one syringe containing 10 Cc. (therapeutic dose).

SAUBERMANN RADIUM EMANATION ACTIVATOR (See New and Nonofficial Remedies, 1925, p. 315).

The following apparatus has been accepted:

Saubermann Radium Emanation Activator, 100,000 Mache Units: An apparatus which imparts about 36 microcuries (100,000 Mache units) to about 500 Cc. of water daily.

Health Program for County.—The county and state health authorities should agree on a health program to be undertaken, the general guides being (*a*) the relative importance and the relative preventability of the disease or group of diseases; (*b*) the conjectural value of those health activities not directed specifically against particular diseases, and (*c*) the psychologic response of the people to the service.—Parran, Thomas, Jr.: *Pub. Health Rep.* **40**:987 (May 15) 1925.

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SATURDAY, NOVEMBER 7, 1925

A NEW CONCEPTION OF GLYCOGEN FORMATION

Nearly three quarters of a century has elapsed since Claude Bernard's discovery of glycogen as a component of the liver. This interesting finding was soon followed by the demonstration that the glucose-yielding carbohydrate is ordinarily present in a large variety of tissues. Glycogen occurs not only in the higher animals but also in the lowly forms, so that it was soon acclaimed as one of the fundamental components of cells. The principal feature of glycogen in the body is its ready conversion to glucose, the characteristic sugar of the blood. This was recognized at the outset of the study of the subject. Knowledge of the genesis of glycogen has been attained more gradually, until today there is general agreement that it can be formed not only from carbohydrates but also from proteins—and perhaps from fats. Bernard himself looked on glycogen as a product formed in a way analogous to the secretions. Succeeding physiologists, however, have promoted the idea that this carbohydrate is a storage product; hence it was often designated as "animal starch," in contrast with starch that is a deposited source of food in plants.

Markowitz[1] of the physiologic laboratory at the University of Toronto has offered the criticism that if glycogen were merely a storage material, it should be possible to exhaust it by starvation. As a rule this is not so; in fact, it may accumulate during starvation. If conditions are developed whereby the organism, notably the liver, actually becomes glycogen-free, it is seemingly impossible to maintain the indispensable content of sugar in the blood, and thereupon disaster ensues. Markowitz has pointed out that, in the light of the common conception of glycogen as a storage material in the body, the actual accumulation of the substance in the liver during starvation, sometimes to the extent of several per cent., is a paradox. The observation, he remarks, suggests that liver glycogen is an essential step in the transformation of fat or protein to carbohydrate. When this transformation cannot take place, as after phosphorus poisoning or liver extirpation, the blood sugar falls and the organism dies unless glucose is supplied to it. Glycogen thus cannot be compared directly with the fat depots of the well fed organism; for it seems to be an obligatory, and not an optional, step in the formation of blood sugar from the noncarbohydrate stores of the organism. In other words, glycogen may serve as an essential intermediate step in the metabolism of carbohydrate, so that the absolute quantity of glycogen in the organism is a balance between glyconeogenesis and glycogenolysis.

If these views are well established, glycogen should no longer be regarded as a "static" substance in the body but rather as a dynamic material which the organism is always consuming, and almost as quickly replacing. This newer conception of the important function of glycogen as an indispensable intermediate in sugar metabolism affords a rationale for the seemingly contradictory facts that insulin, on the one hand, facilitates the utilization or consumption of sugar, yet is a potent factor in the storage of glycogen. As glycogen is stored in the liver of depancreatized animals, following the administration of both carbohydrate and insulin, and since the respiratory quotient under the same conditions rises markedly (thereby indicating sugar combustion in the body) it is evident, to quote the words of Joslin,[2] that the beginning and end of carbohydrate metabolism is dependent on insulin.

1. Markowitz, J.: Glyconeogenesis, Am. J. Physiol. **74**: 22 (Sept.) 1925.

2. Joslin, E. P.: The Treatment of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1923, p. 24.

FRESH FRUITS AND VEGETABLES: VITAMINS AND BACTERIA

The importance of fruits and vegetables in the dietary of man is attested by the instinctive food choices of many generations as well as by the teachings of the science of nutrition. It has long been easy to furnish a satisfactory explanation of the individual nutritive virtues of many of the more familiar components of the human regimen in terms of proteins, fats, carbohydrates or, perhaps, inorganic salts that they happen to furnish in special abundance. The fruits and green vegetables have not fitted so easily into the groups of "energy-yielding" or "tissue-building" nutrients. Consequently, only recently could more cogent reasons be offered for their use. It would be quite possible for a person to omit fruits and vegetables from his diet without running the risk of not getting enough starch, sugar and protein. On the other hand, fruits and vegetables have rather been regarded as essential to health because they may supply certain desirable substances not usually found in other food materials. There was a time when flavor

and texture were their reputed advantages. More recently their content of inorganic substances and above all their supply of the various indispensable vitamins has given them unique importance.

Reviewing our knowledge of the subject, McCollum [1] points out that fruits appear from the results of chemical analysis to be closely comparable in their composition to the familiar vegetables such as the tubers and roots. They all contain much water and varying amounts of sugars, and are relatively insignificant as sources of protein or fat. They are much more attractive to the palate than are most of the vegetables. They enjoy the popular reputation of possessing mild laxative properties, and tend to increase elimination by virtue of their mild diuretic qualities, part of which are due to the extra water consumption and part to the action of certain salts of organic acids they contain. Fruit juices or the edible parts of fruits differ from the cereal grains, and resemble in an important respect the vegetables, which are morphologically tubers or roots. There is an excess of basic radicals, which renders their ash alkaline, whereas most seeds give an acid ash. Meats are also of acid character. The meat and bread portion of our diet, when oxidized in metabolism, leads to the formation of an excess of acid over base forming substances. It is now a well established fact that a certain alkali reserve in the blood is essential to maintain its capacity to carry carbon dioxid to the lungs for elimination, and that a common pathologic condition, acidosis, exists in which this reserve falls below normal. This forms sound reason, McCollum continues, why the addition of fruits and vegetables to the diet tends to the establishment of a proper acid-base equilibrium in the various fluids of the body. The fruits differ from the leafy vegetables in containing little calcium. They resemble the tubers and roots, as they do not tend to supplement the deficiencies of seed or meat products in this respect. Nearly a decade has elapsed since our entry into the World War. There is already a peculiar historical interest merely in reading the following "official" war-time advice of the United States Food Administration: Vegetables and fruits represent a different and happier phase of the food situation than that of most of the staples. They represent a great potential reserve of foods for home consumption. Not only does their presence in the diet add to health, but it releases other foods for shipment abroad.[2]

The food consumer of the present day is confronted with an apparent conflict of advice in his desire to partake freely of the fruits and vegetables. On the one hand, there are recurring admonitions of the unsuspected dangers that may lurk in fresh foods which are commonly eaten uncooked. Putrefactive bacteria and botulism, typhoid and paratyphoid germs are some of the more or less indefinite terrors to be recalled in this connection. In the East, the prevalence of infectious diseases has raised the presumption that the organisms causing them are often conveyed by the eating of fresh fruits and vegetables—a possibility emphasized by the widespread use of human excreta as fertilizer. It has even been asserted that this practice is likely to increase among market gardeners near the large cities in this country where the immigrant farmers tend to continue the agricultural customs of their native country. On the other hand, although safety might be secured by adequate sterilization of such foods through cookery, we have been warned that heat is destructive to the indispensable vitamins. The well known genesis of scurvy on a regimen of heated milk is commonly cited in justification of such claims.

In the midst of this quandary as to the wise procedure in diet, certain newly established facts are alike helpful and reassuring. The reports of the destructive effects of heat on vitamins as a class have been "grossly exaggerated." The lability seems to apply more particularly to vitamins A and C and to depend largely on the conditions of heating employed. When the possibility of oxidation is precluded, as in commercial canning rather than open-air heating, the loss of vitamins is greatly reduced, if not actually negligible. Vitamin B is notably resistant to heat at boiling temperature. Furthermore, the extensive investigations of Mills, Bartlett and Kessel [3] at the Peking Union Medical College, in China, have brought new evidence that normal uninjured fruits and vegetables do not contain living bacteria within their tissues. We fail to realize that nature has provided these foods in sterile packages for our use. Bacteria do not penetrate the unbroken skin of fruits and vegetables kept under market conditions. Finely divided particulate matter, corresponding in size to bacteria, protozoan cysts and helminth ova, does not penetrate the stem end of fresh vegetables to any appreciable extent. Bacteria pathogenic to man may gain entrance to fruits and vegetables through injured and decayed portions, where they may remain viable and spread to a limited extent. It is therefore advisable to remove such portions before attempting the sterilization of food in any way. However, harmful micro-organisms may persist on the surfaces of fruits and vegetables for many days, according to the Peking bacteriologists. Their investigation of methods of chemical disinfection of vegetable matter in the East, through chlorination, permanganate, alcohol or comparable means has been disappointing. Hence they admonish us that dipping fruits and vegetables for

1. McCollum, E. V.: The Newer Knowledge of Nutrition, Ed. 2, New York, the Macmillan Company, 1922, p. 141.
2. Food and the War. United States Food Administration, Cambridge, Mass., Houghton Mifflin Company, 1918.
3. Mills, R. G.; Bartlett, C. L., and Kessel, J. F.: The Penetration of Fruits and Vegetables by Bacteria and Other Particulate Matter, and the Resistance of Bacteria, Protozoan Cysts and Helminth Ova to Common Disinfection Methods, Am. J. Hyg. 5: 559 (Sept.) 1925.

ten seconds into boiling water is the only method thus far discovered that will uniformly kill all pathogenic bacteria, protozoan cysts and helminth eggs that might be found contaminating such food products and render them safe for human consumption in an uncooked condition. The traveler in the Orient, as well as the resident at home in the Occident, may now be comforted by the assurance that with proper sterilization or cookery his quota of fruits and vegetables may be made microbiotically safe—and that without undue deprivation of the vitamins.

THE LIVER AND THE PANCREAS IN DIABETES

Mann and Magath [1] of the Mayo Foundation have demonstrated cogently that the maintenance of the normal level of sugar in the blood is absolutely dependent on the liver. The latter organ and its functioning are equally essential in the maintenance of a hyperglycemic blood sugar level, such as is observed in failure of the pancreatic activities on which the combustion of sugar in the blood seems to depend. It has been noted that the increase in blood sugar following pancreatectomy is dependent on the presence of the liver. Without an adequate amount of functioning liver tissue, the increase in blood sugar following removal of the pancreas does not occur. Thus it has been proved in another way that, whatever may be the process of carbohydrate metabolism, the liver has a vital part in that process. Distinction between the normal and the diabetic organism disappears when both liver and pancreas are removed from the body.

In commenting on these features of the metabolism of carbohydrates, Murlin [2] of the University of Rochester, N. Y., remarks that, if the liver must be present to produce the diabetic state on removal of the pancreas, we have at least a partnership instead of an individual agency to keep us normal. May it not well be, he asks, that both Minkowski and von Noorden were right, in a measure? The former set up the "failure of combustion" theory, the latter the "overproduction of sugar" theory. Banting gave us the hormone necessary to combustion, thus supporting Minkowski; but, Murlin adds, it is destroyed by too much sugar.

The last thesis cannot yet be regarded as completely demonstrated, though it is strongly supported by Murlin's studies. It has been established that insulin may be inactivated by reducing agents,[3] and perhaps reactivated by exposure to oxidizing agents. This suggested the possibility that the pancreatic hormone might be inactivated by reducing sugars, thus explaining their antidoting effects and conceivably throwing some light on the genesis of diabetes. Murlin's observations leave little doubt that in vitro, at least, an excess of glucose can render insulin impotent; it is quite likely that a similar reaction occurs in the organism itself; hence the antidotal effect of sugar against overdosage with the pancreatic hormone. Normal carbohydrate metabolism demands a proper balance between insulin and sugar. In securing this, more than one organ may be involved; and in failure to maintain the balance, the liver as well as the pancreas may at times be responsible. Speculation on the genesis of diabetes from this point of view may presently prove to be worth while.

1. Mann, F. C., and Magath, T. B.: Studies on the Physiology of the Liver, IV, The Effect of Total Removal of the Liver After Pancreatectomy on the Blood Sugar Level, Arch. Int. Med. **31**: 797 (June) 1923.
2. Murlin, J. R.: Inactivation of Insulin by Glucose with a Comment on the Genesis of Diabetes, Science **62**: 352 (Oct. 9) 1925.
3. Allen, R. S., and Murlin, J. R.: Inactivation and Reactivation of Insulin, Proc. Soc. Exper. Biol. & Med. **22**: 492 (May) 1925.

AIR CURRENTS IN VENTILATION

The oppressiveness of an unventilated room is something that is recognized by our sensations. The effects may vary from slight discomfort to actual malaise, all of which proper ventilation aims to avert. There was a time when hygienists were greatly concerned about the chemical composition of the air in relation to health and comfort, when the "badness" of air in ordinary buildings was sought in the form of excessive amounts of carbon dioxid or more poisonous organic respiratory products. One even heard about the fatigue-producing toxins of expired air. Scientific investigation has failed to support such explanations. In considering ventilation, it attaches importance not to the chemical composition of the air but rather to physical properties, temperature, humidity and movements of the surrounding atmosphere. Successful ventilation, a well known British report states,[1] depends on the prevention of stagnation of body heat, on the one hand, and of uncomfortable chilling of the body, on the other.

The fresh and comfortable sensation produced in well ventilated rooms, in contrast with an oppressive environment, is now believed to be due in no small degree to air movement. Success in effecting a feeling of well being through ventilation consists apparently in preventing the discomfort of distinct drafts without permitting actual stagnation of the air. Baetjer [2] has recently pointed out that the movements which give comfort under ordinary room conditions seem to lie somewhere near the threshold of perceptibility. The play of a current of air on the skin may set up a number of changes, any one of which or a combination of all of which may react on our feelings of comfort. Baetjer suggests further that the current of air may stimulate directly the cutaneous sensory

1. Hill, L.: The Science of Ventilation and Open Air Treatment, Part II, Medical Research Council, Privy Council, Special Report Series, No. 52, London, His Majesty's Stationery Office, 1920.
2. Baetjer, Anna M.: Threshold Air Currents in Ventilation, Am. J. Hyg. **4**: 650 (Nov.) 1924.

fibers (pressure, temperature), and the sensations thus aroused may contribute immediately to our feelings of comfort or discomfort, or they may act in an indirect way, for example, by a reflex effect on metabolism or on the vasomotor apparatus. The skin surface may undergo a vasoconstriction or a vasodilatation, locally or generally, with a resulting change in the cutaneous temperature sensations. Or the current of air may affect us by its physical effect on the skin. Heat dissipation may be influenced by changes in convection and evaporation, according to the condition of the air in regard to temperature and moisture.

The actual experiments of Baetjer in the laboratory of physiologic hygiene at Johns Hopkins University indicate that currents of air in the neighborhood of the threshold of perceptibility contribute to our comfort, in all probability, by acting on the sensory nerves of the skin, directly or indirectly, and arousing cutaneous sensations of an agreeable kind. Currents as slight as 0.15 meter a second give a perceptible stimulus to the sensory nerves of the cheek. The value of the threshold velocity varies with the temperature, but is independent of the humidity of the current air. When current air temperature equals normal room air temperature, the threshold velocity varies from 0.2 to 0.3 meter a second. The fact that the threshold value for velocity, as determined by experiment, depends on the temperature of the current of air would lead to the belief that the temperature nerves are mainly concerned. The higher the temperature, the greater must be the velocity of the current to be perceived. Therefore, according to Baetjer, in ventilating a room, the amount of air movement should be controlled by the temperature of the moving air. As shown by her practical experiments, a room at ordinary room temperatures in which the currents are below the threshold limit produces an uncomfortable feeling of closeness, while one with currents much above the threshold values becomes unpleasant on account of the drafts. Baetjer also suggests that since an air current of threshold value is perceptible when it first strikes the skin, but ceases to be perceptible when continued for a few minutes, it is possible that air currents, rising above and falling below the threshold velocity and varying in temperature, produce a series of mild cutaneous stimulations of agreeable character. Possibly this factor may serve to explain in part the preference often expressed for window ventilation under favorable conditions over mechanical systems. In any event, the lesson from the latest experiments is that, in the case of crowded or overheated rooms, a system of ventilation which delivers the circulating air at a somewhat lower temperature than that of the room and at or slightly above threshold velocities should give the best result. Speaking practically, the air movement in a well ventilated room should not fall below the threshold value for the skin of the cheek.

Current Comment

THE DAILY INTAKE OF IODIN

The interrelation between iodin and the thyroid glands has become so familiar to both the physician and the intelligent layman that its significance no longer calls for explanation or emphasis. So far as the genesis of those thyroid conditions that are remediable by administration of iodin is concerned, fundamental facts have largely been wanting. There has been a well founded conjecture that somehow in those regions where endemic goiter is most common the availability of iodin in the air, the potable waters or the food supply must be restricted in comparison with what is true in the areas of comparative immunity from goiter among both man and animals. The quantities of the element that are involved in these differences are extremely small—amounts less than "parts per million" of the food and drink. Such minute proportions call for great refinement of analytic methods. It is the merit of McClendon of the University of Minnesota to have furnished striking illustrations of the parallelism between the incidence of endemic goiter and the iodin content of foods derived from the regions especially concerned. A similar service has since been performed by von Fellenberg [1] of Bern, in Switzerland. In places where thyroid disturbances are notably prominent, the distribution of iodin in air, water and animal foods in particular was found far less abundant than in other places known to be essentially free from endemic goiter. The differences were further accentuated by the contrasting iodin content of the excreta of persons in the localities compared. Relative richness in iodin always accompanied the more normal conditions. What this means in a quantitative way is differences of the order of magnitude of 0.05 mg. of potassium iodid or 0.038 mg. of iodin daily in the intake. Contemplation of such minute amounts—a few hundredths of a milligram—brings us to better realization of the large importance of "little things" in nutrition.

THE SIGNIFICANCE OF UROBILINURIA

The occurrence of urobilin or its immediate precursor in the urine of certain patients has long been recognized. The rational clinical interpretation of the significance of urobilinuria has awaited the more precise determination of the factors that are responsible for its genesis, transport and excretion. The long existing uncertainty as to where urobilin is formed in the body seems at length to be dispelled. The story of its behavior has been developed in a satisfactory way through the researches, among others, of McMaster and his co-workers [2] at the Rockefeller Institute of Medical Research. Thus, under normal conditions, in the dog at least, urobilin is formed only within the intestinal tract. Drainage of the entire bile quantity under sterile

1. Von Fellenberg, T.: Untersuchungen über das Vorkommen von Jod in der Natur, VI, Ueber den Zusammenhang zwischen der Häufigkeit des Auftretens von Kropf und dem Jodgehalt der Umwelt, Biochem. Ztschr. **152**: 141, 1924.
2. McMaster, P. D., and Elman, R.: J. Exper. Med. **41**: 503, 513 (April), 719 (June) 1925.

conditions, or retention of it by common duct occlusion, results in the prompt disappearance of the pigment from the excreta and bile. The animal becomes in fact urobilin-free. But whenever bilirubin enters the intestine urobilin is rapidly formed, part escaping with the feces while another part is absorbed from the bowel, either as such or in the form of related pigments. This secondary resorption and resecretion play an important part in the normal fate of urobilin. The latest investigations of Elman and McMaster [3] demonstrate that animals rendered urobilin-free by collection of all the bile without contact with the intestine remain urobilin-free even after severe hepatic injury. This negatives the assumption that pathologically altered liver cells can manufacture urobilin. The latter is unquestionably a product of bacterial action in the intestine or biliary passages. It is not the product of a damaged hepatic tissue, as urobilinuria is never found after liver injury except when bile pigment has been present in the intestine. When, however, the alimentary formation of urobilin becomes possible, urobilinuria is a prominent symptom of liver injury; thus it is the expression of the inability of the liver cells to remove from the circulation the urobilin brought by the portal stream, with the result that the pigment passes on to the kidneys and the urine. Indeed, urobilinuria occurs with a far less degree of liver injury than does bilirubinuria. The diagnostic possibilities revealed by such facts are important.

Association News

THE DALLAS SESSION

Papers for Section on Orthopedic Surgery

Any Fellow of the American Medical Association who wishes to present a paper before the Section on Orthopedic Surgery at the annual meeting is requested to communicate with the secretary of the section as soon as possible.

All requests for place on the program must be accompanied by an abstract of the paper. Requests for place on the program are acted on by the Executive Committee.

ARCHER O'REILLY,
3534 Washington Boulevard, St. Louis.
Secretary, Section on Orthopedic Surgery.

Conference on Negro Health Work.—A conference was held at the office of the Surgeon General, U. S. Public Health Service, October 21, to further health work among negroes. Among the delegates to the conference were Dr. Helen A. Moore, American Child Health Association; Franklin O. Nichols, National Health Council and the American Social Hygiene Association; William B. Matthews, National Tuberculosis Association, and R. Maurice Moss of the National Urban League. "More National Negro Health Work" was adopted as a new slogan. Plans to revise the literature used in this work were considered and a program outlined for National Negro Health Week during 1926. The National Tuberculosis Association, American Red Cross and the American Child Health Association have agreed to furnish special literature. The conference adjourned to meet at Tuskegee Institute, Jan. 30, 1926, when this literature will be ready for distribution. Emphasis was made on the necessity for better understanding on the part of the public of the negro health problem.

3. Elman, R., and McMaster, P. D.: Studies on Urobilin Physiology and Pathology, IV, Urobilin and the Damaged Liver, J. Exper. Med. 42:99 (July) 1925.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Bust of General Gorgas.—The bronze bust of the late Surg. Gen. William C. Gorgas, to be presented to the state by the Medical Association of the State of Alabama, has been received at the state health department from New York.

CALIFORNIA

Officer's Commission Stolen.—The secretary of the California State Board of Medical Examiners writes that the commission of Dr. Harlen A. Todd, Visalia, given him as a medical officer in the U. S. Army during the World War, was stolen during a recent burglary.

Optometrists and the Title "Dr."—According to press reports, Attorney General U. S. Webb has advised the state board of optometry that California optometrists cannot legally call themselves "Doctors" or "Drs." in prefixes, and can only add the affixes of "Opt. D." or "O.D." when they are graduates of an accredited school of optometry; also that no California optometrist may hold out to his prospective patients that he possesses "special knowledge" of optometry as defined in the act, which defines optometry as a mechanical and not a medical science.

Society News.—The seventy-third semiannual meeting of the Southern California Medical Association will be held, November 6-7, at the Ebell Club, Los Angeles, under the presidency of Dr. Rexwald Brown, Santa Barbara. Among the speakers will be Dr. Robert E. Ramsay, Pasadena, "Myelocytomatosis Following Subcutaneous Administration of Whole Blood in a Child with Severe Leukopenia"; Dr. T. Homer Coffen, Portland, Ore., "The Failing Heart"; Dr. Samuel H. Watson, Tucson, Ariz., "Heliotherapy in Pulmonary Tuberculosis," and at 8:15 p. m., Saturday, Sir John Adams, emeritus professor of education, University of London, will speak on "Sherlock Holmes—A Study in Observation."

CONNECTICUT

Thyroid Survey.—The U. S. Public Health Service is making a thyroid survey in Connecticut at the request of the state department of health. It will cover several cities or towns in each county in the state and represent in each the examination of groups of from 500 to 1,000 school children. The primary purpose is to ascertain the percentage of thyroid enlargement and incidentally to study its relation, if any, to focal infection.

Psychiatry at Yale.—Dr. Milton C. Winternitz, dean, Yale University School of Medicine, New Haven, announced, October 31, plans for the development of work in psychiatry and mental hygiene in that school. He said, according to the New York *Times*, that the faculty of the school of medicine had placed the creation of a department of psychiatry in the foreground of its problem of development, and that Yale hopes to train physicians who "are familiar with the problem of human personality" rather than specialists. With the appointment of Dr. Arthur H. Ruggles as lecturer in psychiatry and consultant in mental hygiene to the university department of health, Yale initiates a program for the study and prevention of abnormal mental reactions in individuals. "A sane approach to the problem among the students," he said, "promises to meet with as much success as it has in general community life." The General Education Board and a Yale graduate have each provided $15,000 a year to initiate this program.

DISTRICT OF COLUMBIA

Society News.—Dr. Everett M. Ellison was elected president of the Wapiya at the annual meeting, October 27; Dr. Stewart B. Muncaster, vice president, and Dr. Fred Y. Williamson, secretary-treasurer. Wapiya is an organization of more than 100 physicians who are members by virtue of their membership in the University Club. Meetings are held weekly, and twice a month they are devoted to some subject other than medical. The official organ of the Wapiya is the

Tom Tom; the editors are Drs. John A. Foote and Ralph S. Pendexter.

Report of Public Health Committee.—A report made by the Public Health Committee of the District Board of Trade shows that during 1924 there were reported to the health department 6,553 deaths (4,140 white and 2,413 colored) making a death rate of 13.46 per thousand. The deaths from typhoid fever were eighteen white and one colored, a rate of 3 per hundred thousand; from scarlet fever, seven white and one colored, a rate of 1.6 per hundred thousand; from whooping cough, four white and nine colored, a rate of 2.6 per hundred thousand; from diphtheria, thirty, twenty-six being white and four colored, a rate of 6.2 per hundred thousand; from influenza, twenty white and thirteen colored, a rate of 6.8 per hundred thousand; from pulmonary tuberculosis, 204 white and 270 colored, giving a death rate of 97.3 per hundred thousand; 533 from cancer, 403 white and 130 colored, a rate of 109 per hundred thousand. The number of suicides were seventy-seven white and seven colored, a rate of 17.3 per hundred thousand. The number of homicides was nineteen white and thirty-five colored, a rate of 11.1 per hundred thousand. The Public Health Committee again urgently recommended an increase in the number of physicians, dentists, dental clinics and nurses for the public schools. It recommended, among other things, that twelve additional nurses be provided, four additional dental clinics be established and eight additional dentists and twelve dental nurses or assistants be provided.

FLORIDA

Personal.—Dr. James R. Bean has returned to the laboratories of the state board of health as senior bacteriologist after an absence of nearly nine years.

Society News.—Twenty-five members of the Orange County Medical Society, comprising Orange, Osceola and Seminole counties, each recently gave twenty-four hours to the instruction of Boy Scouts at the encampment of the Central Florida Council at Plymouth.

HAWAII

Pan-Pacific Medical Conference.—At the recent annual conference of the Medical Association of Hawaii, a resolution was passed endorsing the first Pan-Pacific Medical Conference, which will convene in Honolulu in 1928 just prior to the Pan-Pacific Women's Conference. The following committee was named: Dr. Nils P. Larsen, chairman; Dr. Goichi Asami, Dr. Harry H. Blodgett, Dr. Wah K. Chang, Dr. Clarence E. Fronk, Dr. Roger J. Mermod, Dr. Iga Mori, Dr. Vasco E. M. Osorio, Dr. Carl F. Reppun, Dr. Archibald N. Sinclair, Dr. C. B. Wood and Dr. Yon C. Yang.

IDAHO

Increase in Death Rate.—The death rate for Idaho for 1924, according to the Department of Commerce, was 787 per hundred thousand of population, as compared with 708 in 1923. The increase was due largely to increases in the death rates from diseases of the heart, cancer, tuberculosis, measles, syphilis, intestinal diseases and accidental causes.

ILLINOIS

Personal.—Dr. John P. Denby, Carlinville, has been elected president of the Illinois Tuberculosis Association.——Dr. Ira W. Johnson, Bridgeport, has been appointed county physician of Lawrence County.——Dr. Edward G. Ahrens, formerly with the Minnesota State Tuberculosis Sanatorium at Ah-gwah-ching, has been appointed medical director of the Macon County Tuberculosis Sanatorium, Decatur.

Chicago

Children's Home.—The Illinois Children's Home and Aid Society, 308 North Michigan Avenue, maintains receiving institutions at Duquoin and Evanston for a laboratory study of children prior to placement, and a training school at Potomac for vocational training. These institutions have a capacity of twenty-five, forty-five and thirty, respectively. The society cares for more than 1,650 children, over 1,000 of whom are in private families which receive no compensation, and over 300 of which are with private families where board is paid by the society, parents or friends; the other children are cared for temporarily by cooperative Chicago agencies.

Personal.—A dinner will be given in honor of Dr. Robert H. Babcock by his medical friends at the Drake Hotel, November 10.——Edward E. Slosson, Ph.D., editor of *Science Service*, will lecture, November 9, in Orchestra Hall under the auspices of the University of Chicago on "Chemistry and Human Welfare."——Dr. Agnes Beulah Cushman has been elected secretary of the Chicago Council of Medical Women. Dr. Mary M. S. Johnstone, of the Tuberculosis Division of the Veterans' Bureau, has been transferred temporarily to St. Louis.——Dr. Patrick J. H. Farrell was elected surgeon general of the Military Order of the World War, at the annual meeting in New York, September 26.

New Plans for Medical Arts Club.—At a meeting of the board of directors of the Medical Arts Club, held October 30, it was unanimously voted to change the name of the club to the Medical and Dental Arts Club of Chicago. C. N. Johnson, D.D.S., retiring president of the American Dental Association, was elected a member of the board of directors. Mr. John A. King was elected as business manager in place of Mr. David MacLean. The report of the Chicago Trust Company, trustee, showed that there were in the hands of the trustee $214,173.08 as a nucleus for a building fund. Plans for a building include an assembly hall seating from 700 to 800 for the regular meetings of the Chicago Medical and Chicago Dental societies and for other professional meetings and conventions, rooms for the various local special societies, headquarters for the Chicago Medical and Chicago Dental societies, the Illinois State Medical and Dental societies, the American Dental Association and others; club rooms for the convenience of the members; bedrooms for resident and out of town members and guests; the remainder of the building, including 75 per cent. of the total available space, to be rented as stores, offices and salesrooms to firms doing business with physicians and dentists.

Society News.—Dr. Anton J. Carlson addressed the South Chicago Branch of the Chicago Medical Society, October 27, on "Recent Advances in the Physiology of the Alimentary Canal."——States Attorney Robert E. Crowe addressed the Englewood Branch of the Chicago Medical Society, November 3, on "The Doctor and the Law."——There was a reception at the Chicago Athletic Club, November 4, in honor of Sir William Arbuthnot Lane and Mr. Philip Franklin, London, England, and a dinner given by the officers of the Chicago Medical Society previous to the general meeting in the Marshall Field Annex. The subject of the address of Sir W. Arbuthnot Lane was "Present Treatment of Fractures," and that of Mr. Philip Franklin, "Newer Developments in Laryngology."——Dr. William Allen Pusey will open the discussion from the dermatologic standpoint, and Dr. Maurice Lewison from the tuberculosis standpoint, following the joint paper on "The Noticeable Parallelism and Similarity Between Leprosy and Tuberculosis" to be presented before the Chicago Medical Society by Dr. Oswald E. Denney, U. S. Public Health Service, and Dr. John Ritter, Chicago, November 18.——Dr. Lewis E. Daniels, Detroit, will address the Chicago Roentgen Ray Society, November 10, at the Virginia Hotel, on "Roentgen Ray in Pathologic Pregnancies and Labor." Dr. Joseph B. DeLee will open the discussion.——The next meeting of the Chicago Laryngological and Otological Society will be November 19 at the Hotel Sherman.——Sir W. Arbuthnot Lane, London, addressed the Chicago Surgical Society at its regular meeting, November 6, at the University Club, on "Chronic Intestinal Stasis," and Dr. Donald C. Balfour, Rochester, Minn., on "Disabilities Following Gastro-Enterostomy." The regular clinical meeting of the society began at 9 o'clock at Michael Reese Hospital.

INDIANA

Society News.—Dr. William Allen Pusey, Chicago, past president of the American Medical Association, will conduct a clinic for the Tippecanoe County Medical Society, St. Elizabeth's Hospital, LaFayette, November 12, and, following a banquet at the LaFayette Club at 6 p. m., will give an address on syphilis. Members are invited to bring cases of skin disease of any kind whatever to the clinic.——Dr. Kellogg Speed, Chicago, addressed the St. Joe County Medical Society, South Bend, October 25, on "Fractures."

IOWA

Society News.—Dr. Merrill M. Myers, Des Moines, conducted a clinic on heart disease before the Jackson County Medical Society, Maquoketa, and addressed the society at the evening session on heart disease. The clinic was held under the auspices of the Iowa Tuberculosis Association.

Superintendent Appointed.—It is reported that Dr. Jesse L. McElroy, director of St. Mark's Hospital, New York, has been appointed head of the State University of Iowa Hospital, Iowa City, to succeed Dr. Bert W. Caldwell, resigned. Dr. McElroy was also formerly superintendent of the Ancker Hospital, St. Paul, Minn.

KENTUCKY

Infantile Paralysis Epidemic.—Following a conference of the city health officer of Louisville with physicians, an order was issued closing the public schools, October 22, on account of an outbreak of infantile paralysis in that city. There had then been, it is reported, nineteen cases and four deaths. There were six cases of infantile paralysis in Owensboro also, October 22, with two deaths.

Superintendent Appointed.—Dr. Paul A. Turner, Seattle, formerly state health officer of Washington, has been appointed superintendent of the Kentucky State Tuberculosis Sanatorium at Louisville, to succeed the late Dr. Samuel W. Bates. Dr. Turner, who has already taken up his new position, was also formerly city health officer of Seattle and superintendent of the Seattle Tuberculosis Sanatorium.

LOUISIANA

Castellani Accepts Professorship at Tulane.—Dr. Aldo Castellani, now professor in the London School of Tropical Medicine, has accepted an appointment as head of the department of tropical medicine at Tulane University of Louisiana School of Medicine, New Orleans, and will arrive in that city in December. The reorganized department of tropical medicine will have three assistant professors and a staff of technicians and will provide training for undergraduate and graduate students; it will conduct research on the dietary problems of tropical climes, on disturbances arising from fungi, on the parasitic diseases, and on the results of exposure to tropical sunlight. Professor Castellani was born in Florence, Italy, in 1875. He graduated from the University of Florence, did postgraduate work at the University of Bonn, and was a member of the Royal Society's commission in Uganda, 1902-1905, and director of clinique for Tropical Diseases and physician to Colombo General Hospital, 1903-1915; he discovered the cause of African sleeping sickness (trypanosomiasis) in 1902 and the cause of yaws (frambesia) in 1905. He is the co-author of a standard textbook on tropical diseases and the author of many contributions to scientific journals (THE JOURNAL, May 2, p. 1363).

MARYLAND

Personal.—Maynard M. Metcalfe, Ph.D., Johns Hopkins University School of Hygiene and Public Health, Baltimore, sailed for Rio de Janeiro, September 26, as a representative of the Smithsonian Institute, Washington, D. C., to study certain species of the one-cell parasite *Opalina*, at Montevideo.

Cancer Meeting.—The Frederick County Medical Society and the Maryland Association for the Prevention of Cancer held a joint meeting to discuss cancer at Hood College, Frederick, October 2. Dr. George H. Riggs, president, Frederick County Medical Society, presided, and Drs. Joseph C. Bloodgood, Lewellys F. Barker and Thomas S. Cullen, all of the Johns Hopkins Hospital, Baltimore, were the speakers.

The Grenfell Mission.—Drs. Ralph F. Bowers and Alvin F. Coburn have returned to Baltimore from Labrador, where they were associated with the Grenfell mission during the summer. They cruised along the coast of Labrador on the hospital ship caring for patients and assisting in operations, visited three of the hospitals and nursing stations and instructed fishermen in first aid. They were delighted with the medical facilities in that country as provided by the Grenfell Mission.

Wilmer Institute Opens.—The Wilmer Institute of Johns Hopkins Hospital, Baltimore (for the study and treatment of diseases of the eye), was officially opened, October 29, under the directorship of Dr. William Holland Wilmer, formerly of Washington, D. C. The first unit of the new institute (forty beds) has been established in a wing of the hospital formerly part of the Nurses' Home, which has been renovated and especially fitted up. The next unit will be equipped with research laboratories.

Medal Awarded to Dr. Welch.—The first W. W. Gerhard gold medal offered by the Pathological Society of Philadelphia has been awarded to Dr. William H. Welch, director, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, and will be presented, November 12, when Dr. Welch will lecture before the society. The award was instituted by the Pathological Society of Philadelphia in collaboration with Dr. Arthur H. Gerhard in memory of William Wood Gerhard (1809-1872), who first differentiated typhoid fever from typhus.

MASSACHUSETTS

Personal.—Dr. Richard P. Strong, professor of tropical medicine of the Medical School of Harvard University, Boston, addressed the Medical Society of the State of Pennsylvania at Harrisburg, October 7, on "Spirochetal Infections of Man."——Dr. Guy C. Randall has been appointed state psychiatrist for Essex County to succeed the late Dr. Nelson G. Trueman.

Dr. Bigelow Appointed Commissioner of Health.—Governor Fuller appointed Dr. George H. Bigelow as state commissioner of public health, October 21, to succeed the late Dr. Eugene R. Kelley. Dr. Bigelow graduated from Harvard Medical School, was an intern at Massachusetts General Hospital, Boston, was an officer in the medical corps during the World War, was formerly director of the Cornell University Medical College clinic, New York, and since 1924 has been deputy commissioner of health of Massachusetts and director of the division of communicable diseases.

Appointments at Harvard School of Public Health.—According to the *Boston Medical and Surgical Journal*, Drs. William E. Deeks, Carlos P. Chagas and Alexander H. Rice have been appointed lecturers in tropical medicine at the Harvard School of Public Health; Dr. Albert A. Hornor, assistant in tropical medicine; R. A. Atwater, instructor in epidemiology; L. R. Cleveland, assistant professor of protozoology; Drs. Noel G. Monroe, Halstead G. Murray and Dwight L. Sisco, assistants in industrial medicine; Dr. Francis B. Grinnell, instructor in bacteriology; Dr. Fred W. Morse, Jr., assistant in bacteriology and immunology and John L. Lewis, assistant in vital statistics.

MICHIGAN

Society News.—Dr. Budd C. Corbus, Chicago, addressed the Kent County Medical Society, Grand Rapids, October 14, on "Medical and Surgical Diathermy, with Special Reference to the Treatment of Cancer."——Dr. Henry A. Christian, Hersey professor of theory and practice of physic, Harvard University Medical School, Boston, addressed the Wayne County Medical Society, Detroit, November 2, on "Achlorhydria Family Tree of Diseases."

Sterilization Law Upheld with Exception.—The supreme court of Michigan has decided that the law authorizing the sterilization of mentally defective persons was a valid exercise of police power within the limits of the constitution except as to the second division of Section 7, which the court held unconstitutional as class legislation. This part of the law referred to only those of the feebleminded class who were unable to support any children they might have and whose children probably would become public charges.

Conference of Health Officers.—At the fifth annual conference of health officers and public health nurses, Lansing, November 18-20, Dr. George F. Dick, Chicago, will speak on "Scarlet Fever," and Dr. Frederick Sears, Syracuse, N. Y., on diphtheria prevention. Among the other speakers will be Dr. Albert J. Chesley, commissioner of health of Minnesota; Dr. George T. Palmer, New York; Dr. Guy L. Kiefer, Detroit; Dr. Chalmers J. Lyons, D.D.Sc., Ann Arbor; Henry Vaughan, D.P.H., commissioner of health of Detroit, and Reuben L. Kahn, D.Sc., Lansing. Clarence C. Little, president of the University of Michigan, will address the public evening session on Wednesday.

MINNESOTA

Hospital News.—St. Andrew's Hospital, Minneapolis, is conducting a drive for $200,000 for a 100-bed extension.——The Cancer Institute and the Todd Memorial Hospital of the University of Minnesota were opened early in October, bringing the total capacity of the university hospitals to 300 beds. The Todd Memorial Hospital is for eye, ear, nose and throat patients.

Personal.—Dr. William V. Lindsay, city health officer of Winona, has been elected president of the Winona County Public Health Association.——John E. Anderson, Ph.D., assistant professor of psychology, formerly of Yale University, has taken up his work as director of the Institute of

Child Welfare of the University of Minnesota, Minneapolis, which was recently established under a grant of $250,000 from the Laura Spelman Rockefeller Memorial.——Dr. Henry Longstreet Taylor, St. Paul, president of the Minnesota Public Health Association, has been appointed president of the newly organized Minnesota Trudeau Society.

MISSISSIPPI

Hospital News.—The nurses' home at the South Mississippi Charity Hospital, Laurel, valued at about $75,000, was destroyed by fire, October 11; the occupants escaped injury.

MISSOURI

Hospital News.—Oak Manor, a new member in the group of Bethesda hospitals in St. Louis, was formally opened last month; the institution was made possible by the bequest of the late Mrs. Elizabeth Dilworth, who directed in her will that Oak Manor, her residence, and surrounding grounds be turned over to the Bethesda Corporation. Mrs. Dilworth left also a $350,000 estate which, after the death of her relatives, will revert to the Bethesda hospitals.

Joint Gynecologic Meeting.—The Chicago Gynecological Society was the guest of the St. Louis Gynecological Society, October 10. The members in attendance were entertained at breakfast at the University Club, and at clinics at the Washington University Medical School and at St. Mary's Hospital by the gynecologic and obstetrical department of St. Louis University. Following a dinner at the University Club papers were presented by Drs. Carey Culbertson, H. F. Lewis and George W. Reis, Chicago.

NEW MEXICO

Illegal Practitioner Fined.—George Calle, Albuquerque, was recently sentenced to thirty days in jail and to pay a $30 fine in police court for practicing medicine without a license, it is reported. The witness testified that she paid Calle $10 for a prescription.

State Board Election.—At a meeting of the state board of medical examiners, Santa Fe, October 13, Dr. Harry T. Watson, Gallup, was elected president for the next two years; Dr. William R. Lovelace, Albuquerque, vice president, and Dr. William T. Joyner, Roswell, secretary-treasurer.

NEW YORK CITY

Bequest to Fifth Avenue Hospital.—The will of the late Thomas F. Manville, head of Johns-Manville, Inc., which was probated, October 28, provides for a bequest of $1,000,000 to the Fifth Avenue Hospital of the City of New York, to be used to pay off any mortgage, encumbrance or lien on the hospital property, and the balance to be invested in such securties as the board of trustees of the hospital may decide. The fund is to be known as the Thomas F. Manville Endowment.

Anniversary Discourse.—George E. Vincent, Ph.D., president, Rockefeller Foundation, will deliver the seventy-ninth Anniversary Discourse at the New York Academy of Medicine, November 19, 8:30 p. m., on "The Doctor and the Changing Order." The Anniversary Discourse has been an annual occasion in November at the academy since its foundation in 1847. Among the former orators were Dr. Edward E. Janeway, Dr. William H. Welch, Dr. Hermann M. Biggs, Henry S. Pritchett, Chauncey M. Depew, George W. Wickersham, Mr. John H. Finley and Hon. George McAneny.

Personal.—Dr. Valeria H. Parker was elected president of the National Council of Women, October 31. The council represents forty national women's clubs and societies.——Dr. Samuel A. Brown, president of the New York Academy of Medicine, laid the cornerstone of the new Academy Building, October 30, and Dr. George D. Stewart, professor of surgery, University and Bellevue Hospital Medical College, was the principal speaker at the ceremonies.——George A. Soper, Ph.D., managing director for the American Society for the Control of Cancer, has returned to this city after a three months' investigation of cancer control in Europe.——Dr. Thomas M. Brennan recently was nominated a member of the board by the trustees of the Brooklyn Juvenile Protective Association.——Dr. Pierre Janet, professor of psychopathology, College de France, Paris, recently lectured at Columbia University and at Princeton, N. J.

Tuberculosis Conference.—The New York Tuberculosis and Health Conference, to be held November 19-20 at the Hotel Biltmore and the Academy of Medicine, is considered by the Committee on Tuberculosis and Public Health of the State Charities Aid Association the most important of its kind since the Albany conference of 1910, when President Taft, Governor Hughes and the Hon. Joseph H. Choate were among the speakers. At the coming conference, some of the speakers will be Dr. William H. Welch, director, School of Hygiene and Public Health, Johns Hopkins University, Baltimore; Dr. Theobald Smith, president of the National Tuberculosis Association; Dr. Livingston Farrand, president of Cornell University; Dr. Allen K. Krause, Johns Hopkins University Medical Department; Dr. Charles J. Hatfield of the Henry Phipps Institute, Philadelphia; Dr. Lawrason Brown of the Trudeau Sanatorium, Saranac Lake; Dr. Edward W. Archibald, McGill University Faculty of Medicine, Montreal; Dr. Frankwood E. Williams of the National Committee for Mental Hygiene; Dr. Sanger Brown of the New York State Commission for Mental Defectives; Dr. Frank J. Monaghan, New York City Commissioner of Health; Dr. Matthias Nicoll, Jr., New York State Commissioner of Health, and Surg. Gen. Hugh S. Cumming, U. S. Public Health Service (THE JOURNAL, October 10, p. 1144).

Society News.—The New York County Medical Society conducted a symposium on industrial surgery, October 26, at the New York Academy of Medicine. Dr. Oliver J. Fay, Des Moines, Iowa, discussed "The Evolution of Functional Nervous Disorders in Industrial Surgery"; Dr. Arial W. George, Boston, "Industrial Spine," and Dr. Harry E. Stewart, New Haven, "Physiotherapy in Industrial Injuries."——Dr. Samuel J. Kopetzky, president of the Medical Society of the County of New York, addressed the New York Pharmaceutical conference at the Hotel Pennsylvania, October 26, on "What the Physicians Require of the Pharmacist."——Dr. William H. Park will deliver the first Hermann M. Biggs Memorial lecture, given under the joint auspices of the Medical Society of the County of New York and the New York Tuberculosis and Health Association, at the New York Academy of Medicine, November 19, on "Hygienic and Preventive Measures Against Tuberculosis."——At a meeting of the New York Academy of Medicine, November 5, arranged in cooperation with the section on otology, Dr. Max A. Goldstein, St. Louis, gave a practical demonstration of modern pedagogic methods in the training of the deaf child by teachers and pupils of the Central Institute for the Deaf of St. Louis.

NORTH CAROLINA

Reduced Fares for Cripples.—The railways have arranged to give crippled patients attending the state orthopedic clinics, to be held from time to time in various counties throughout the state by leading orthopedic surgeons, the benefit of reduced railway fares.

Herbalist Sued.—J. H. Nanzetta, self-styled Indian herb doctor, who has been located in Charlotte, is reported to have been sued for $30,000 by one of his victims. It seems that one J. B. Groome of Charlotte, who claims to have been suffering from "weeping eczema," read one of Nanzetta's advertisements and went to the "herb doctor" for diagnosis and treatment. He claims that his condition was greatly aggravated, and that his eyes and other parts of his body "suffered great injury" as a result of Nanzetta's treatment.

Society News.—The annual meeting of the Ninth District Medical Society was held in Lexington under the presidency of Dr. Chalmers M. Van Poole, Salisbury, October 29. Among the speakers were Dr. William deB. MacNider, Chapel Hill, president of the state medical society, whose subject was "Nephritis"; Dr. Frank H. Richardson, Brooklyn, "Malnutrition in Children"; Dr. Verling K. Hart, Statesville, "Mastoiditis," and Dr. D. L. Smith, Spartansburg, S. C., "Physical Examination of the Child." A dinner was served, with Dr. James E. Hobgood, president, Davidson County Medical Society, acting as toastmaster.

Duke University Building Fund.—Our correspondent writes that the probating of the will of the late James B. Duke shows an addition to the endowment of Duke University, Durham, which brings the total of Mr. Duke's contributions to the institution to $40,000,000, and that of the additional sum given, $10,000,000 is for the construction and endowment of the medical school and hospital of Duke University. The will directs the immediate expenditure of $4,000,000 in constructing the medical college and hospital, while the remainder, $6,000,000, is to be for endowment. The university building fund given by Mr. Duke in 1924 ($6,000,000) was increased at the university commencement last year by $2,000,000, and more recently by $7,000,000, making a com-

plete building fund available for immediate construction for the university proper of $15,000,000. The $4,000,000 for the buildings of the medical school and hospital gives all the departments of Duke University $19,000,000 for immediate construction work. North Carolina has not heretofore had the facilities to complete the medical course leading to the degree of M.D.

OHIO

Personal.—Dr. Archibald I. Carson has been elected president of the Cincinnati Board of Health to succeed the late Dr. Edward W. Walker; Dr. Mifflin B. Brady has been elected vice president to succeed Dr. Carson.——Dr. William S. Reed, Stockton, has been reappointed county physician.——Dr. Gaius E. Harmon of the department of hygiene and bacteriology, Western Reserve University School of Medicine, Cleveland, is spending the year 1925-1926 in study with Prof. Karl Pearson at the Biometric Laboratory, University College, London.

Babies and Children's Hospital Dedicated.—Abraham Flexner, secretary of the General Education Board of the Rockefeller Foundation, New York, gave the address at the dedication of the Babies' and Children's Hospital and Maternity Hospital of Cleveland, October 28. Each of these hospitals has a new seven story building on the campus alongside the School of Medicine and the School of Nursing of Western Reserve University, erected with funds collected in a drive in 1923. The Babies' Dispensary, founded in 1906, was the beginning of the present Babies' and Children's Hospital, while the Maternity Hospital was established more than twenty years ago. The buildings are connected by underground passageways. Much of their walls are of glass with sun porches, fresh air wards and glass rooms. A group has been working for more than seventy-five years in behalf of these hospitals. Places on the boards of trustees of this group have gone from father to son, mother to daughter, and from aunt to niece, the nucleus of the group being the early settlers of the Western Reserve Land Company. "University Hospital," which has just applied for a charter, will bring together the Babies' and Children's Hospital, the Maternity Hospital, the Lakeside Hospital and the Rainbow Hospital for Crippled Children with the School of Medicine and the School of Nursing of Western Reserve for teaching purposes.

OKLAHOMA

Personal.—Dr. Rebecca H. Mason, Chickasha, has been appointed resident physician and professor of public health at the Oklahoma College for Women.——Dr. Galvin L. Johnson, Pauls Valley, has been appointed superintendent of health for Garvin County.——Dr. Carl Puckett, state health commissioner, has been elected vice president of the Oklahoma Public Health Association; Dr. Horace T. Price, Tulsa, was elected president.

OREGON

Increase in Death Rate.—The death rate for Oregon in 1924, according to the Department of Commerce, was 1,139 per hundred thousand of population, as against 1,094 in 1923. The increase was due largely to increases in diseases of the heart and in nephritis, cancer, measles, diabetes and diphtheria.

PENNSYLVANIA

Lectures for Nurses.—The Commission for Prevention and Relief of Heart Disease has arranged a program of lectures for graduate nurses under the auspices of the Public Health Association. The first three were given, October 15, 22 and 29, at the Pittsburgh Free Dispensary, and the next three at various hospitals in the city, November 5, 12 and 19, and the subjects were: "Signs of Incipient Heart Disease"; "Care of the Cardiopathic Child"; "Choice of Occupation for Cardiopaths"; "Types of Heart Disease"; "Technic of Nursing in Heart Disease," and "Demonstration of Modern Methods for the Study of Heart Disease."

Society News.—Dr. Frederick M. Allen, New York, gave the first postgraduate lecture before the Allegheny County Medical Society, November 5, at the Carnegie Lecture Hall, on "Pernicious Anemia."——The Philadelphia County Medical Society, Philadelphia, held a cancer control meeting, November 5, which was addressed by Dr. Joseph C. Bloodgood, Baltimore, on "How Can the Medical Profession Teach the Public and Influence Them to Act in Time So That in Many Instances Cancer Can Be Prevented and Properly Treated in Its Earliest and Most Favorable Stage," and by Frederick L. Hoffman, Newark, N. J., on "Some Cancer Problems of Today."——Dr. F. R. Nager, Zurich, Switzerland, addressed the Philadelphia Laryngological Society, November 3, on "Some More Recent Otological Problems" (lantern slide demonstration).——Dr. George W. Crile, Cleveland, adressed the College of Physicians of Philadelphia, November 4, on "A New Point of View Regarding the Control of the Mortality and Morbidity of Operations Within the Hepatic Tract: A Cytoplasmic Rôle of the Liver." The discussion was opened by Drs. John B. Deaver and John H. Gibbon. Dr. George P. Muller addressed the society on "Certain Experiences with Gallbladder Surgery," and Drs. Alfred Stengel and Joshua Edwin Sweet opened the discussion.——Among others, Dr. Pascal Brooke Bland will address a joint meeting of the Obstetrical Society of Philadelphia and the Philadelphia Pediatric Society, November 10, at the College of Physicians, on "Injuries to the Infant During Delivery."

Philadelphia

University Honors Physicians.—The honorary degree of doctor of science was conferred by the University of Pennsylvania recently on Lord Bertram Dawson of Penn, physician to the King of England and the Prince of Wales; Dr. Charles H. Mayo, Rochester, Minn., and Dr. Rudolph Matas, New Orleans. The university held a special ceremony in Houston Hall, where Provost Josiah H. Penniman conferred the degrees.

The Alvarenga Prize.—The Alvarenga Prize for 1925 has been awarded to Dr. Raphael Isaacs, Boston, for his essay entitled "The Nature of the Action of Roentgen Rays on Living Tissue." The College of Physicians of Philadelphia announces that the next award of the prize, amounting to about $300, will be made, July 14, 1926, provided an essay deemed worthy of the prize shall have been offered. The essays may be on any subject in medicine but cannot have been published. They must be typewritten in English and forwarded without signature but marked with a motto and accompanied by a sealed envelop having on its outside the motto and within the name and address of the author. Essays must be received on or before May 1, 1926. Dr. John H. Girvin, 19 South Twenty-Second Street, Philadelphia, is the secretary of the committee of award.

SOUTH DAKOTA

Asylum for Insane Indians.—The superintendent of the Asylum for Insane Indians at Canton noted, in his annual report to the Commissioner of Indian Affairs, Washington, D. C., that there were 100 patients under treatment during the year ending June 30, 1925, and that the applications for admission of nineteen other patients were declined because of the overcrowded condition of the asylum. There were no cases of smallpox during the year, as employees and patients were protected by vaccination. Grain and other food products are produced on the asylum's own land. The superintendent recommended that 160 additional acres be purchased in order to raise farm products to more nearly supply the needs of the institution; he also recommended the erection of a building for epileptics, a chapel and an amusement hall.

SOUTH CAROLINA

Increase in Death Rate.—The Department of Commerce announces that the death rate for South Carolina for 1924 was 1,300 as compared with 1,185 for 1923, and that it was due largely to increases in the death rates from nephritis, heart disease, measles, whooping cough, pneumonia, typhoid fever, cancer, automobile accidents and enteritis.

TENNESSEE

Hospital News.—The new nurses' home and training school of the Memphis General Hospital, Memphis, will be named the "Dr. Marcus Haase Nurses' Home and Training School," in honor of the late Dr. Marcus Haase.

Society News.—Dr. Carl T. Speck, Cleveland, was elected president of the East Tennessee Medical Association, October 22; Drs. P. L. Brock, Morristown, and Walter S. Moore, Etowah, vice presidents, and Dr. G. Victor Williams, Chattanooga, secretary-treasurer, reelected. The next spring meeting will be in Morristown, and the fall meeting in 1926 in Maryville.

Personal.—The governor has appointed, among other members of the Tennessee Tuberculosis Hospital Commission, Dr. Charles A. Abernathy, Pulaski; Dr. Herbert Acuff,

Knoxville, and Dr. James J. Durrett, Memphis. The act creating this commission provides for the establishment and maintenance of hospitals in several grand divisions of the state with the help of the various counties.

TEXAS

Society News.—At the fifty-eighth semiannual meeting of the South Texas District Medical Society, Houston, October 9, Dr. Walter T. Brown, Wallis, was elected president; Dr. William Lapat, Houston, vice president, and Dr. Jewell C. Alexander, Houston, secretary.

Personal.—W. T. Dawson, M.A., for the last two years acting professor of physiology and director of laboratory of pharmacology, Woman's Medical College of Pennsylvania, Philadelphia, has been appointed associate professor of physiology in the Medical Department of the University of Texas, Galveston.

Hatcheries for Top-Minnows.—The board of health of Texas announces plans to establish hatcheries for the propagation of top-minnows *(Gambusia affinis)* with the cooperation of the game, fish and oyster commission, which will furnish the minnows for breeding purposes. The state health officer has advised all communities desiring breeding stock to notify the commission promptly so that there may be sufficient time to propagate enough minnows for stocking all local streams, ponds, tanks or other standing water as an aid in mosquito control.

VIRGINIA

Campaign for Funds.—The Medical College of Virginia, Richmond, will launch a campaign for funds in the near future, it is reported, for a new building for biochemistry, bacteriology and pathology, and will request the next general assembly to increase the appropriation for maintenance of the medical college.

Hospital News.—A committee has been appointed at Farmville to take charge of the erection of a hospital in that community, for which funds will be provided for the cost of the building by the Commonwealth Fund of New York. Drs. William E. Smith, R. Lester Hudgins and Thomas G. Hardy, among others, are on the committee.

GENERAL

Report of Joint Committee on Sight of School Children.—A report has been made by a joint committee of the American Medical Association and the National Education Association, in cooperation with the National Committee for the Prevention of Blindness, on "Conserving the Sight of School Children." The committee studied the practices followed in public schools in caring for the eyesight needs of school children, covering 375 cities, also rural districts in every state, and was assisted by 100 ophthalmologists and by health officials and school authorities. It was found that 3,000,000 school children in this country are handicapped by defective sight and that only half of the total school population of 24,000,000 have their eyes examined and vision tested while attending school. The rural districts generally report a larger percentage of defective vision than the cities. It seems likely, the report adds, that this is due to such differing factors as conditions under which the test results were obtained, bad illumination in rural homes and schools and the small number of corrections provided for rural children. The report summarizes the extent of defective vision in schools and the practices used in conserving the eyesight and gives information for the teacher, school nurse and the school physician in the conservation of vision. The committee was at work more than a year under the chairmanship of Dr. Thomas D. Wood, professor of physical education, Columbia University, New York; it recommends that a uniform law for the examination of the eyes of school children be adopted by all states and cities.

Epidemiologic Report.—The report of the Health Section of the League of Nations, September 15, shows an improvement in the plague situation in India, all of the principal ports with the exception of Rangoon and Bombay having been free from that disease in the four weeks ending September 5. During the period covered by the report, plague was at its annual minimum in most places where it is endemic. There was a fresh outbreak reported from Senegal, Africa, of 119 cases in July, as against seventeen in June. The report shows, however, that cases of plague had occurred in widely scattered places in Africa, Asia and at Pirée in Greece and at Constantinople in Europe. There has been less cholera in India than in 1924, particularly in the valley of the Ganges, and an increase in Burma and in the Madras presidency. A severe epidemic of cholera in Kashmir reached its maximum early in May, and up to July 25 had caused 9,931 deaths, a case mortality rate of 54 per cent. Cholera is endemic in Kashmir, and in 1919 there was an epidemic with 11,516 deaths reported. Yellow fever was reported this year from places in Nigeria, the Gold Coast and Ivory Coast of Africa; one case was reported in Liberia. The report says that the disease appears to be endemic in several areas on the Guinea coast, although the number of cases reported is small. Smallpox has been more prevalent than during previous years in several African countries. There were 966 cases in Algeria this year, as against seventy-two in the corresponding period of last year; 1,546 cases in Nigeria as against 358 last year, and 1,280 as against 118 in the Gold Coast colony. The incidence of smallpox in India was higher this year than in the four preceding years, the maximum having been reached in March-April; 9,931 cases and 2,543 deaths were reported in the four weeks ending July 25, and in the preceding four weeks 12,402 cases and 3,072 deaths. A serious outbreak of smallpox occurred in Korea during the first six months this year, with 2,300 cases and 539 deaths.

Society News.—The next annual Mississippi Valley Conference on Tuberculosis will be held in Chicago under the auspices of the Chicago Tuberculosis Institute in June, 1926. ——At the annual meeting of the American Hospital Association, Louisville, Dr. Arthur C. Bachmeyer, superintendent, Cincinnati General Hospital, Cincinnati, was installed as president; Dr. Richard G. Broderick, director of hospitals, Alameda County Hospital, San Leandro, Calif., was made president-elect; Dr. Walter H. Conley, medical superintendent, Metropolitan Hospital, Welfare Island, N. Y., Miss Blanche M. Fuller, superintendent, Nebraska Methodist Episcopal Hospital, Omaha, and Mr. Wallace W. Kenney, superintendent, Victoria General Hospital, Halifax, N. S., vice presidents; Dr. William H. Walsh, Chicago, executive secretary, and Mr. Asa S. Bacon, superintendent, Presbyterian Hospital, Chicago, treasurer.——At the annual meeting of the Medical Association of the Southwest, El Paso, Texas, November 5-7, Dr. John H. Musser, New Orleans, professor of medicine, Tulane University of Louisiana School of Medicine, discussed "The Diagnosis of Cancer"; Dr. Edward Jackson, Denver, "Recent Views of Cancer by Experience with Ocular Tumors"; Dr. Mallory B. Culpepper, Carlsbad, N. M., "Tularemia"; Dr. Benjamin H. Orndoff, Chicago, professor and director of the division of roentgenology, Loyola University School of Medicine, "Radiotherapy of Malignancy with Special Reference to Breast Carcinoma"; Dr. John C. Wilson, Los Angeles, professor of clinical orthopedic surgery, College of Medical Evangelists, "Evaluation of Surgical Splinting in Spinal Caries," and Dr. Henry A. Rasmussen, U. S. Public Health Service, Fort Stanton, N. M., "Report of a Case of Pulmonary Tuberculosis Treated with 'Sanocrysin'." Colonel Shockey, M. C., U. S. Army, invited the society to the William Beaumont Hospital on the Military Reservation for its annual clinic.——The officers of the Association of American Medical Colleges were reelected at the recent annual meeting in Charleston, S. C. Dr. Hugh Cabot, Ann Arbor, Mich., is president; Dr. David L. Edsall, Boston, vice president, and Dr. Fred C. Zapffe, 3431 Lexington Street, Chicago, secretary. The next annual meeting will be in Cleveland, Oct. 25-27, 1926.

Report of Children's Bureau.—According to a report of the director of the Children's Bureau, U. S. Department of Labor, there were 290,590 children examined under the Maternity and Infancy Act in the fiscal year 1925. There were 10,806 child health conferences, 3,581 prenatal conferences attended by 35,997 women and 8,047 midwives who completed midwives' courses, 622 child health centers and fifty-seven permanent prenatal centers established. All states except Illinois, Kansas, Maine, Massachusetts and Connecticut are now cooperating under the provisions of the Maternity and Infancy Act, under the terms of which each state accepting receives $5,000 outright and an additional $5,000 when matched by the state, and the balance of the appropriation of Congress is distributed among the states on the basis of population. The total amount accepted by the states from the 1924 appropriation was $918,280.49, the largest amount accepted by any one state being about $80,000 by New York. In addition to the work already noted there have been established in twenty-four states a total of about 3,000 "little mothers" classes to teach girls of the seventh and eighth grades or older the proper care of infants, since they are so often their mothers' helpers. Although the "centers and consultations"

are for well babies, defects are frequently found which require correction. The most frequent defects are refractive errors, orthopedic defects, nasopharyngeal growths, dental caries, malnutrition and enlarged glands, and these children are always referred to the family physician for correction, if there is a physician. However, poverty and lack of physicians necessitate special arrangements, and a few states have clinics at which defects may be corrected by a staff physician or by a specialist engaged for the purpose. The report says that in most places this work is done by local physicians after nurses have explained the need of it to parents and made special arrangements for it for the indigent. Some states have estimated the percentages of defects that have been thus corrected; Indiana, for example, made a series of surveys to find out what corrections had been made; South Dakota reported 490 corrections among 2,725 cases examined; Pennsylvania reported 8,678 corrections, a great majority of which involved the teeth and tonsils and adenoids.

Bequests and Donations.—The following bequests and donations have been announced recently:

The Lake County Memorial Hospital, Painesville, Ohio, $10,000 by the will of Stella L. Cummings.

The Brooklyn Home for Blind and Crippled Children, the Brooklyn Catholic Orphan Asylum, and the Home for the Aged of the Little Sisters of the Poor, each $5,000, by the will of the late Mary L. Fraser.

The Home for Incurables, New York, about $15,000, by the will of the late Laura Varian.

Jennie Stuart Memorial Hospital, Hopkinsville, Ky., $10,000, by the will of John Hubbard.

The New York Association for the Blind, $5,000, and the Herman Knapp Memorial Eye Hospital, New York, $5,000, by the will of William E. Stiger, New York.

The University, Children's and Chestnut Hill hospitals, Philadelphia, and the Bethesda Children's House, will share equally in the estate of J. E. Smith, valued at more than $50,000, on the death of the last beneficiary of the trust fund.

Roosevelt, Methodist, Rush, and Children's Homeopathic hospitals, all of Philadelphia, each $1,000, by the will of the late Charles Lockhart.

The Women's Homeopathic Hospital, Philadelphia, $3,000, by the will of Madeline K. Vandergrift, Philadelphia.

St. Joseph's Home for the Blind, Jersey City, N. J., the Home for Incurables, St. Vincent's Home, and St. Edmund's Home for Crippled Children, $1,000 each, and $500 to the Misericordia Hospital, by the will of the late Nellie Lynn, Philadelphia.

The Episcopal Hospital and the Women's Hospital, Philadelphia, each $1,000, by the will of Lina B. H. Sedridge, Philadelphia.

The Fifth Avenue Hospital, New York, $50,000, by the will of the late John E. Meek.

Prospect Heights Hospital and Brooklyn Maternity, Brooklyn, N. Y., $3,000, by the will of the late Mrs. Mary A. Carmen.

The Mary J. Drexel Children's Hospital, Philadelphia, an endowment of $5,000 for three beds.

The Jewish Hospital Association of Philadelphia, the residue of the estate of Julia Mayer, whose will stipulates that at least $100,000 shall be expended for an addition for the aged and infirm at the Jewish Hospital as a memorial to her parents, and should this not be considered practical, that sum may be used toward the construction of a maternity building.

James M. Jackson Memorial Hospital, Miami, Fla., $500,000, by the will of James M. Deering, to be used for maintenance.

St. Peter's Hospital, Brooklyn, $500, by the will of the late Mary A. McCafferty.

St. Peter's Hospital, Brooklyn, $500, by the will of the late Andrew Wachter.

The New York Orthopedic Dispensary and Hospital, New York, the residuary estate of the late Mrs. Caroline James, Northport, Long Island, said to be more than $300,000.

Mount Sinai, Presbyterian, Ruptured and Crippled, Skin and Cancer hospitals, New York, $81,657 each, by the will of the late Simon R. Weil.

LATIN AMERICA

Personal.—Dr. Luis da Silva Santos retires from the chair of anatomy at Rio after many years' service.——Dr. J. P. Fontenelle, Rio, director of the *Folha Medica* fortnightly journal, has left for the United States on the invitation of the Rockefeller Foundation to study public health administration and allied subjects.——The *Brazil-Medico* states that the imprisonment of Prof. Bruno Lobo, of the chair of bacteriology, Rio de Janeiro, still continues, and that the students, in protest, are still on strike.——Dr. Rocha Vaz presided at the recent meeting at Rio which decided the foundation of the Instituto Brazileiro de Sciencias. It aims to assemble all those who have contributed to the progress of science in Brazil "by discovery of some law or fact not previously inscribed on the records of pure or applied science."

FOREIGN

Personal.—Dr. Brongersma, professor of urology at Amsterdam, as the spokesman of the corresponding members of the French Association d'urologie, presented 44,000 francs to the association at its annual meeting at Paris in October. The income is to be awarded for the best work on disease of the urinary apparatus.——A communication in the *Presse médicale* states that Prof. I. P. Ivanov, Moscow, is soon to leave for French Guinea for research on anthropoids. He has been offered a place in the Pasteur Institute at Kindia, in French West Africa, where there is a simian colony for research. Ivanov has been conducting research on artificial fecundation for twenty-five years, and is especially interested in cross fertilization by this means.——The *Hospitalstidende* relates that Dr. G. Roussy, professor of pathologic anatomy, Paris, has been invited by the Danish Neurologic Society and the Cancer Research Committee to deliver three lectures at Copenhagen on neurologic topics and radiotherapy of cancer. ——Dr. Charles Nicolle, director of the Tunis Pasteur Institute, has been invited by the Argentine public health service to inspect the northern provinces and suggest means to improve health conditions. The *Prensa Médica* hails him as the most important contributor to science that has ever visited Argentina, citing his discovery of the louse as the vector of typhus, his priority in the transmission of syphilis to monkeys and his discoveries in other fields of tropical medicine.

Deaths in Other Countries

Major General Sir **Hayward R. Whitehead,** director of medical services in Malta during the World War, at Lyndhurst, September 28; aged 70.——Dr. **B. Etchepare,** professor of psychiatry at Montevideo, president of the local medical society and of the Uruguay Psychiatry Association, and an officer in the public health service.

CORRECTION

Trip Postponed.—Surg. Gen. Hugh S. Cumming, U. S. Public Health Service, writes that by reason of urgent official duties, he was prevented from making the trip to Plymouth, Cherbourg and Bremen which was noted in THE JOURNAL, October 24.

Government Services

Ambulance Aeroplane

According to the *Army and Navy Journal,* the latest type of army aeroplane is the Cox-Klemin XA-1 type machine, which will carry two patients, an attendant and the pilot at 120 miles per hour; it is equipped with a self-starter and facilities for attending the sick with some comfort. A machine of this type was recently exhibited at Albrook Field, Balboa. This was the first time that an ambulance has been assigned to the air force of the Canal Zone.

Army Resignations

Major Edgar A. Bocock, M. C., resigned, October 31, and has been appointed superintendent of the Colorado General Hospital, Denver. One of Major Bocock's last assignments in the army was as superintendent of the Santa Tomas Hospital in the Panama Canal Zone.——Lieut. James A. Smart, M. C., resigned, effective, November 1.

Veterans' Bureau Resignations

The following physicians recently resigned from the Veterans' Bureau: Dr. Chester C. Box, August 3, at Lake City, Fla.; Dr. George D. Bragaw, June 30, at Palo Alto, Calif.; Dr. Bennette A. Burks, August 31, at Memphis, Tenn.; Dr. Paul G. Haire, August 15, at Rutland, Mass.; Dr. Roy T. Haskell, August 15, at Washington, D. C., and Dr. Edwin F. Sullivan, August 4, at Tupper Lake, N. Y.

Change in Army Transport Medical Service

The Quartermaster Corps of the U. S. Army has inaugurated a policy which relieves from transport duty those medical officers who heretofore have been assigned regularly as transport surgeons. In the future, medical attendance on army transports will be furnished by medical officers who are making the trip as a passenger. The new policy has already gone into effect.

Examination for Army Medical Corps

The Adjutant General announces that examinations of candidates for commission in the Medical Corps of the Regular Army will be held, Jan. 11-15, 1926, at various army posts. Candidates must be not less than 22½ nor more than 31½ years of age, and must have been graduated in medicine at a reputable medical college, and have had one year's hospital experience subsequent to graduation. They must pass the written examination and undergo a physical examination.

Physicians who have licenses from the National Board of Medical Examiners may be exempt from the written examination if they desire on submitting proper evidence. The examination is for the purpose of filling sixty vacancies which exist in the Medical Corps. Successful candidates will be commissioned with the rank of First Lieutenant. Requests for permission to take the examination should be addressed to the Adjutant General of the Army, Washington, D. C.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 24, 1925.

The Campaign Against Cancer

At the meeting of the grand council of the British Empire Cancer Campaign, it was announced that grants, since the formation of the campaign over two years ago, to existing laboratories, new schemes of research, purchase of radium and commitments, including the formation of the *Journal of Abstracts* and its maintenance, amount to more than $375,000. On the recommendation of the scientific advisory committee, a grant of $5,000 per annum for six years was made to Dr. Thomas Lumsden at the Lister Institute of Preventive Medicine to enable him to relinquish private practice and devote his whole time to continuing his experimental work on serums in connection with seeking a cure for cancer and other allied lines of research. The application of Dr. Mottram, to which a grant has already been made of $4,000, to bring his scheme into line with the recent discoveries of Dr. Gye and Mr. Barnard, was approved. The radiology committee reported that the whole of the $25,000 worth of radium purchased for the campaign for the purpose of cancer research has been allocated to various hospitals. It was reported that Lieut.-Gen. Sir John Goodwin (formerly director general of the army medical service), organizing adviser to the campaign, is completing his plans for the formation of permanent county committees in support of the central campaign.

Osteopathy, Chiropractic and Other Cults

In previous letters, the introduction of osteopathy into this country and the formation of the British Osteopathic Association and its attempt to obtain recognition from the government have been described (THE JOURNAL, June 27, p. 2014). Osteopathy and other eccentric cults have now attracted so much attention from the public that the medical profession cannot entirely ignore them.

Sir Holburt Waring devoted his presidential address to the Medical Society of London to "Osteopathy, Chiropractic and Other Cults and Medicine," because of inquiries he had received from medical friends as to their advantages, disadvantages and dangers. He began by explaining that osteopathy was a system of treatment based on the assumption that all disease was caused by some part of the organism being out of adjustment or alinement, as in the case of a displaced bone, cartilage or ligament, or in the case of adhesions or contractions of muscle resulting in unnatural pressure on, or obstruction to, a nerve or blood vessel. Investigation had shown him that different osteopaths had varying ideas as to what was comprised in the term and what were the limitations of treatment. A later definition seemed to include the use of the term "inhibition" or the relief of pain or muscular spasm by the application of steady pressure. Osteopathic treatment consisted in manipulation to correct the supposed displacement. "Chiropractic" had been defined as a system of adjusting subluxated vertebrae by hand for the restoration of health. Its theory is that disease is the result of pressure on nerves as they emerge from the spine. Diseases of the eye and ear were treated by both osteopaths and chiropractors in a similar manner, although the nerves supplying these organs did not come from the spinal cord.

A number of other cults had sprung from these, of which Sir Holburt referred to only one—"naprapathy." Its exponents asserted that the basal centers of life were located in the medulla oblongata or basal portion of the brain and, therefore, manipulations were applied to the nearest portion of the surface, the nape of the neck. Thus, all these cults based their practice on a theory that was untrue. Patients suffering from severe affections were liable to be seriously damaged by having these methods practiced on them. In a case of appendicular abscess, the treatment was applied and the abscess burst, with fatal result. In many cases the manipulations caused acute dissemination of carcinomas and sarcomas. Sir Holburt had also seen many cases of tuberculous disease of joints, in which serious damage had been caused by forcible manipulation and movement. Some of the reported cures were probably due to suggestion, others to the result of manipulations and the breaking of adhesions between muscles and nerves and the adjacent tissues.

In conclusion, Sir Holburt held that our laws ought to be amended so as to place all medical practitioners on the same educational level, because of the danger to the public of being deceived by plausible theory and unfounded claims. A number of graduates of the schools of these cults in the United States had come to this country and were attracting patients by blatant advertisement. The government should take a strong stand in protecting the health and life of the community.

The Influence of Sunshine and Open Air on Health

At the recent international congress on climatology held at Davos, Prof. Leonard Hill read an important paper on the influence of sunshine and open air on health, a subject which he has made very much his own. He said that there was no evidence that "ionization" of the air had any influence on health, nor were the ozone content and the chemical purity of the air of fundamental importance at mountain and seaside resorts. The existence of ozone at sea level was not proved. The chemical purity of the air, so far as concerned carbon dioxid and oxygen, was not of any importance, and no chemical poison was present in the air of crowded rooms. It was microbic infection by catarrhal diseases that occurred in stuffy rooms. Sedentary work in warm, stagnant air required compensation by vigorous exercise and by sleeping with open windows. The tendency in recent years had been to overheat rooms and to overclothe. Turning to the effects of light, Professor Hill emphasized the value of ultraviolet irradiation and the loss of these rays from smoke pollution, glass windows and clothes. Tuberculosis should not be treated in hot sun boxes, but with cool air and sun treatment in the early morning. Skyshine gave much more ultraviolet radiation than direct sunshine. All children in smoky cities should be given arc light baths twice a week in winter to prevent disease. Hospitals should be built as bungalows out in the country with verandas and open courts for the beds. Patients should be prepared for operation by ultraviolet irradiation, which raises the resistance of the body to infection.

Fatal Explosion in a Boy's Mouth During an Operation

A fatal explosion, of which the cause remains obscure, has taken place in a boy's mouth during an operation. A boy, aged 16, collided with a motor car while cycling. He was taken to the hospital, where his jaw was found to be fractured. In the course of an operation on the jaw, it was found necessary to keep the teeth dry by means of warm air supplied through a dental syringe. Ether and oxygen were the anesthetics used. On the third application of the warm

air, an explosion occurred at the back of the boy's mouth. Acute hemorrhage followed, and he died in ten minutes. At the inquest, Mr. Percival Cole, a surgeon and an authority on injuries of the jaw, who performed the operation, said that after the explosion the apparatus used burst into flames. During the war, 1,600 cases of this sort passed through his hands, and what was done in this case was merely routine work. Ether is very inflammable, but there was no naked flame near. In his opinion, the explosion was due to a mixture of vapors. The teeth were smeared with alcohol and had afterward to be made perfectly dry, otherwise the dental cement would not adhere. The anesthetist gave evidence that in 1,200 cases he had never encountered anything similar to what happened in this case. The jury returned a verdict that death was due to accident.

The Post-Graduate Medical Journal

The Fellowship of Medicine and the Post-Graduate Medical Association have issued the first number of a new monthly medical journal, of which the price is 12 cents. Its object is to supply the postgraduate student with details of postgraduate teaching in this country and elsewhere; to supply a medium for the expression of his requirements, and, if need be, the ventilation of his grievances. The first number begins with a foreword from Sir William Hale-White, who refers to some of the difficulties of efficient postgraduate teaching in this country, especially to the dissatisfaction engendered by endeavoring to teach undergraduates and postgraduates together. He advocates the building, in London and other large cities, of medical schools for postgraduates only, with hostels attached to them. The journal will publish a selection of the lectures delivered at the instance of the Fellowship of Medicine, supplemented by specially contributed articles and clinical descriptions. Only such subjects as will from their essential character make a strong appeal to the general practitioner will be published. The first number contains two lectures: one, by Sir Humphry Rolleston, is on the "Medical Aspect of Gallstones." He concludes that there are two factors in the formation of gallstones—the infective and the metabolic, which may operate alone but probably more often operate together. The most common form which the first factor takes is infection of the alimentary canal with *Bacillus coli*, which is carried to the liver and excreted in the bile. The metabolic factor consists of an increase in the cholesterol content of the blood and so in the bile. The second lecture is by Dr. T. Watts Eden, on the "Prevention of Puerperal Sepsis." He points out that puerperal sepsis occurs in all kinds of practice—in the private practice of midwives and physicians, among the well-to-do as well as the poor, and in midwifery hospitals. The causes he regards as obscure. One that he emphasizes is coitus in the last four weeks of pregnancy. Apart from gonorrhea infection, he considers that microbes may thus be conveyed. In regard to prevention, he recommends antenatal care and guarding the patient from all possible sources of infection during and after labor.

Tuberculous Cattle and Environment

In the *Veterinary Journal*, Dr. John Robertson, health officer for Birmingham, has called attention to a serious defect in our treatment of the tuberculosis problem in cattle. He has no hesitation in saying that at most dairy farms we are unwittingly doing our best to propagate tuberculosis. We keep the majority of our dairy cows in dark, ill ventilated sheds; we milk these cows twice or thrice a day—an exhausting process—and in many cases we underfeed them. "Are we not," asks Dr. Robertson, "concentrating too much on testing and slaughter and not devoting enough of attention to the more difficult question of the cow's environment and food?" His main recommendation is that the veterinary profession must be convinced of the necessity for much better cowsheds and that the farmer must be taught the predisposing causes of tuberculosis and must avoid them on his farm. On the subject of tuberculous meat, Dr. Robertson says that while its consumption is repugnant he has never known the diseased meat usually found in slaughterhouses to produce ill effects. He further points out that meat infected with anthrax has been cooked and consumed without bad results and that it is dangerous only in the process of handling before cooking.

Children Killed in Street Accidents

The terrible increase of fatal accidents in the streets, due to the motor traffic, has been pointed out in previous letters. In a small volume, just published by the National Safety First Association, entitled "Safety First for School and Home," the author, Mr. G. A. Christian, gives some valuable hints from his experience as inspector of schools to the London County Council. He tells us that of the appalling number of persons killed in the streets of London last year—866—more than a third were children. Children have one large source of danger special to themselves, that associated with mischief and the playing of games in the street. Many juvenile accidents occur from stealing rides on vehicles and from running into the road after a ball.

PARIS

(From Our Regular Correspondent)

Oct. 12, 1925.

Industrial Diseases in France

The official bulletin of the ministry of labor contains information pertaining to industrial diseases in 1923, and their relation to the act of Oct. 25, 1919. Thus far, under the provisions of this act, only lead and mercury poisoning are considered. There were 1,025 cases of lead poisoning in 1923, as against 797 in 1922. The increase may signify merely that, as the law becomes better known, notifications are made more regularly. In 744 cases the diagnosis was simple lead colic. In 114 cases no exact diagnosis was made. The other cases are distributed among the complications of lead poisoning. The period of disability, which ranged from eight to fifteen days, was stated in only half of the cases. One notification read, permanent partial disability; another, probably permanent disability. Nine notices mention hospitalization of the patient, and nine cases were fatal.

The industries that gave rise to lead poisoning were enameling of metals, 278 cases; manufacture and maintenance of storage batteries, 249 cases; manufacture of red lead, 150 cases; metal foundries, 58 cases, lead foundries and plating with lead, 54 cases; painting of buildings, 41 cases; printing, 26 cases, and others.

In 1923, the number of cases of mercury poisoning was reduced to five. The diagnoses were: mercurial stomatitis, one; mercurial trembling, two; nephritis, two. In one case, disability extended over several months.

Taxi Chauffeurs and Mental Affections

Addressing the Société medico-psychologique, April 27, 1925, Toulouse, Dupouy and Schiff pointed out that they had examined the mental condition of thirty-six taxi chauffeurs. They found: psychasthenia, obsessions and impulses without dementia, 12; toxicomania, 2; epilepsy, 2; chronic alcoholism, 5; alcoholism with symptoms of dementia, 2; various dementias, 2; general paralysis, 10. They emphasized the great medicosocial interest that the question presents.

Emergency Treatment of Wounds

Lenormand and Moure, addressing the recent international congress on industrial accidents, discussed the influence of

recent war experience on the therapeutics of wounds. They distinguished a first period during which wounds were dressed and patients then evacuated; a second period of débridement and drainage; a third period of continuous irrigation following débridement and succeeded by secondary suturing, and finally a fourth period, which began with the primary suturing of fresh wounds. Primary suturing of wounds, after excision of contused tissues, effects rapid recovery in slight wounds but it is not without danger.

Lenormand and Moure pointed out that the objects sought in treating war wounds and those of civil practice are not the same. War surgery is collective; it seeks to limit the number of losses, without spending too much time with individual cases. The cases in which primary suture did not prove successful were given secondary consideration because the method presented great advantages for the state.

In industrial accidents, however, surgery must sacrifice everything for the safety of the injured individual. Even the slight possibility of loss of life or limb will influence the choice of a therapeutic method.

Lenormand and Moure emphasized the influence of first dressings on the whole evolution of the wound, and the need of complete examination of the patient. They emphasized the importance of the extraction of foreign bodies from punctured wounds. The search for fragments of pins and needles should always be considered a delicate operation, since they may entail considerable laceration and expose the patient to infection. They discussed likewise immediate therapeutic indications in (1) wounds limited to the soft parts; (2) wounds affecting the bones and joints, and (3) crushed and dismembered limbs.

1. Lenormand and Moure explained primary suture of wounds of the soft parts. Its indications seem limited to fresh wounds of the scalp and face and to superficial cuts about the arms and legs. In contused wounds, especially where there are many muscles, it is more prudent not to attempt primary suture. Every case in which a wound is sutured primarily requires close supervision of the local and general condition. The tendons and nerves must not be sutured other than in fresh wounds susceptible of primary suture. Wounds of trunk arteries are subject to conservative operation when an associated fresh wound of the soft parts in itself justifies primary suture. Whenever infection is probable, the two ends of a vessel in the wound should be sutured.

2. As to wounds affecting the bones and joints, in open fractures immediate intervention is required. The object should be to cleanse the traumatized area and to reduce and immobilize the fracture. Only fragments that are completely detached should be removed; all bone splinters that have preserved a connection with the soft parts should be left. When the area of the fracture has been cleansed, the fragments should be adjusted and maintained in place. Plaster-of-Paris casts do not give good results. It is best to use apparatus that combines continuous extension and suspension. Osteosynthesis in complicated fractures should be avoided if possible. Bone union can be best accomplished by means of external apparatus. Internal prosthesis by sutures, plates, clamps, rings and the like is seldom indicated in complicated fractures, and it should never be regarded as permanent. Its sole object is to prevent, for the time being, the displacement of a fragment. It would be exceedingly imprudent, after having cleansed the area of a complicated fracture, to employ osteosynthesis, to close the wound and treat it like a closed fracture. In wounds of the joints, the operative indications vary with the importance of the lesion. In simple punctured wounds of the joints no operative intervention is indicated; compression and immobilization should be the rule. Larger wounds of joints, without bone lesions, are susceptible of primary suture, which constitutes the only means of preventing secondary infection. Joint wounds associated with grave bone lesions require either primary resection or amputation.

3. In dealing with crushed and dismembered limbs, the authors emphasize solely the need and technic of amputation. If the patient is in shock, it is preferable to institute at first active general therapy and to postpone amputation until the general condition of the patient is satisfactory. Sometimes the patient, although he has lost little blood and is still conscious (presenting neither nervous nor hemorrhagic shock) grows steadily weaker in spite of the usual protective and restorative measures employed. In such cases it may be assumed that he is suffering from toxic or from toxic-infectious shock. The only means of saving such a patient is to amputate at once. If a tourniquet has been applied, it should not be removed before amputation. There should be no amputation with flaps and no closure of the wound. The indications for circular amputation at the level of the injury are here the same as in war. General anesthesia should be light and preferably ethyl chlorid or nitrous oxid. Blood transfusion or the injection of physiologic sodium chlorid solution should be extensively used.

Lenormand and Moure discussed also the indications for antitetanus and for antigangrene serotherapy.

BERLIN

(From Our Regular Correspondent)

Oct. 10, 1925.

A Department for Industrial Diseases

Through the action of the Prussian minister of commerce and industry, a department for industrial diseases has been established in the Empress Augusta Victoria Hospital in Berlin. The location of the hospital in the eastern section of the city, in the vicinity of numerous manufacturing establishments, makes it an excellent vantage point for the treatment of industrial injuries. Although Italy, two years before the war, established in Milan the clinic for occupational diseases, under the direction of Professor Devoto, and also soviet Russia has founded richly endowed institutes for the investigation of the relations between industrial work and disease in workmen, Germany has had until now no similar institution. Since July 1, 1925, compulsory medical notification of important industrial diseases, such as lead poisoning, glassmakers' cataract, benzene and anilin poisoning, has been in force. In order that the medical profession may become more familiar with these diseases, which, fortunately, are comparatively rare, lectures and laboratory courses in the field of industrial diseases in general have been organized.

Excess of Deaths over Births in Berlin

In recent years, Berlin has had an excess of deaths over births. However, during certain weeks of 1924, there was a slight predominance of births over deaths, and, during the first quarter of 1925, the births in Greater Berlin exceeded the deaths by almost 600 (in 1924, in the corresponding period, there were 4,400 more deaths than births). This better result was secured, in spite of the fact that, in February and March, infant mortality and death from pulmonary tuberculosis and other respiratory diseases is higher than for the other months. Taking these facts into account, an excess of births over deaths amounting to 6,000 may be expected for the year 1925, as against an excess of deaths over births of 5,000 for 1924. From the reports so far, also the mortality rate for 1925 will be improved, as against the rate for 1924.

The Preservation of Milk

Not only in the medical press but also in lectures and in petitions, there have been of late repeated complaints from physicians, veterinarians and others, on the use of milk

preservatives. The employment of these preservatives was due, in part, to the erroneous belief that the addition of alkali carbonates (soda, for example) was permissible.

Under war and postwar conditions, treatment of slightly sour milk with alkali carbonates had to be permitted, since fresh milk was scarce and the supply of milk that reached the places of consumption in a slightly sour condition could not be dispensed with. The partial neutralization of milk slightly sour made it usable. Neutralization, however, had to be carried out with considerable care in order to be successful. Therefore, in 1918, the federal health bureau published directions for the treatment, with alkali carbonates, of whole milk that was slightly sour. Permission to use this method was accorded only to those dairy establishments which were supervised by efficient communal leagues and whose equipment and business management guaranteed that the method would be followed. Only milk with less than 15 degrees of acidity could be subjected to such treatment, the acidity could be reduced only to 6 degrees, and the treatment had to be carried out under the direction of a chemist, who assumed responsibility for errors. Treated milk had to be plainly tagged, and care had to be taken to prevent its use for children under 2 years of age. There is no proof that any injuries resulted from its use, and if the directions for treatment were strictly followed, no soapy taste nor alkaline reaction resulted. In the meantime the supply of milk has increased. Permission to use the neutralization method has therefore been withdrawn. Nor is treatment of milk with hydrogen peroxid now permissible.

The Licensing of Chauffeurs

The city council of Leipzig has passed an ordinance requiring all chauffeurs to pass an examination as to their technical qualifications and mental fitness before they are granted a license. The licensing board, acting in cooperation with Professor Klemm, the director of the department for applied psychology of the Psychologic Institute at the University of Leipzig, has adapted the existing psychotechnical methods to the special purpose in hand and has applied them thus far to about thirty applicants.

GENEVA

(From Our Regular Correspondent)

Oct. 15, 1925.

Criminal and Therapeutic Abortion

In all civilized countries, criminal abortion is forbidden by law and punishment is meted out to offenders. The only exception to the law is when the mother's life is endangered by pregnancy and the only way to save her is by inducing miscarriage. Various legislations admit this exception, and the codes of several of the Swiss cantons contain clauses in which this principle is admitted and provided for.

The drafts of the new criminal code of Switzerland, recently drawn up, sanction the classic rule and include abortion among misdemeanors. The commission appointed to draw up the draft in September last adopted the federal council's point of view, which provides for this therapeutic exception in article 107, which reads:

> Abortion performed with the consent of the pregnant person by a physician is not punishable if undertaken for the purpose of removing a danger impossible to deal with otherwise, threatening the mother's life or portending serious and permanent detriment to her health.

This text was vigorously assailed, and several amendments were proposed to enlarge the limits between which abortion is criminal. Finally, the commission decided to add other exceptions to Article 107, so that if it is finally adopted abortion will be admitted not only when the mother's life is involved, but also when pregnancy results from rape or incest; when at the time of conception the mother was insane, an idiot, unconscious or incapable of resisting—hypnosis, narcosis, etc., or if at the time abortion is practiced, the father or the mother is insane.

Prof. Paul Logoz of the faculty of law of the University of Geneva contested these innovations before the commission, putting forward the following arguments:

In the case of rape. At first sight, this might appear to be perfectly legitimate, but in practice it may not be feasible because it raises the question of proof of rape. To exact a legal sentence in all due form would in most instances render the law permitting the victim to submit to abortion deceptive. Even proof of rape by witnesses—should this be considered sufficient—would be very exceptionally possible; rape is not committed before witnesses, and the identity of the aggressor is not always known. As to the physician whose services are solicited, how can he at this late date (that is to say, when all traces of violence have usually disappeared) establish undeniably the fact that the woman has been raped? Therefore, is he to proceed with abortion simply on the affirmation of his client? What upright physician would venture to risk his professional reputation in these circumstances?

The case of incest. Professor Logoz next shows that in this case the situation becomes still more intricate, because by revealing the origin of her pregnancy, the victim exposes herself to criminal proceedings against her. Now, the commission considered that all that was necessary was to assure an effective control of therapeutic abortions by compelling the physician to inform the proper authorities of the operation about to be undertaken. It goes without saying that no matter what authorities are notified, none are bound by professional secrecy. On the contrary, when unlawful acts are brought to their notice, it is their strict duty to notify the public prosecutor.

Such are Professor Logoz' legal arguments in the case of rape and incest. As to the other hypotheses—impregnation of an idiot, etc., or insanity of the father or mother at the time of the induced abortion—these are strictly questions of eugenics. It is to improve the race that the fetus is destroyed. Professor Logoz is likewise opposed to these reasons, and he points out that it must be unqualifiedly demonstrated that defective individuals invariably engender defective offspring. There are many physicians who maintain that proof of this has never been given and that, on the contrary, the laws of heredity are as yet insufficiently known, so that it is quite impossible to offer an opinion as to the future of the descendants with any degree of certainty.

Dr. F. Naville of Geneva has recently put forward some interesting statistics which somewhat invalidate Professor Logoz' point of view. For example, he relates the history of several consecutive generations of a family in which vagrancy, alcoholism, immorality, prostitution, imbecility, insanity and criminality were family qualities. Of the 310 subjects comprised in the generations whose history could be reliably studied, practically none—children or adults—were spared the defects of their ancestors.

Naville also gives the genealogical tree of five generations descended from a mentally defective female. Of 834 subjects composing this family, there were 709 among whom there were 181 prostitutes, 142 beggars and vagrants, seventy-six criminals (seven being murderers), and sixty-four who had been in prison for various misdemeanors and in all had produced 106 illegitimate offspring. Taken altogether, the members had passed 116 years in prison and had been supported or aided by the state for 734 years, representing a cost of about six million francs ($1,200,000).

Given such data as these and many similar ones from other sources, it is evident that anything that can be done to improve society should be seriously discussed, be it induced abortion or sterilization of defective individuals.

Marriages

RANDOLPH MCCUTCHEON, Fairmont, W. Va., to Miss Gladys Gertrude Lumsden of Richmond, Va., September 19.

FRANK B. STAFFORD, Charlottesville, Va., to Miss Nancy Letitia Morton of Bluefield, W. Va., September 4.

JOHN WILLIAM LANE, Kenosha, Wis., to Miss Evalyn Pauline Griffin of Rock Island, Ill., October 21.

WILLIAM T. HAMILTON, Philadelphia, to Miss Emma S. Rothermel of Collingswood, N. J., October 8.

JOSEPH E. BEIDEMAN, Norristown, Pa., to Miss Rebecca Morris Balmer of Valley Forge, June 24.

CLARENCE GEORGE FISCHER to Miss Madeline Cashin, both of Peoria, Ill., October 6.

PETER M. HERNY to Miss Helen W. Harp, both of Prairie City, Iowa, October 1.

HAROLD R. WARNER to Miss Mary Wilson, both of Harrisburg, Pa., August 2.

CARL WINFRED STOMBERG to Miss Jessie Lees Smith, both of St. Paul, recently.

BERRYMAN GREEN, JR., to Mrs. Alice Gordon, both of Denver, September 14.

Deaths

Juan Guiteras died suddenly at his home in Matanzas, Cuba, October 28, aged 73. Dr. Guiteras graduated from the University of Pennsylvania School of Medicine in 1873; was on the staff of the Philadelphia Hospital from 1873-1879, in the U. S. Marine hospital service from 1879-1889; professor of medicine, Charleston (S.C.) Medical School, 1884-1888, professor of pathology at his alma mater, 1889-1899; professor of general pathology and tropical medicine, University of Havana, 1900-1921; director of the Las Animas Hospital, and from 1909 to 1921, director of public health in Cuba. He was president of the National Medical Congress of Cuba, 1905; secretary of public health and charities, 1921-1922, and a member of the Yellow Fever Commission of the International Health Board of the Rockefeller Foundation since 1916. Dr. Guiteras was closely associated with work on yellow fever in the United States and Cuba for many years, and was among the first to confirm the experiments of Walter Reed and his associates on the U. S. Army Yellow Fever Commission.

Francke Huntington Bosworth, New York; Bellevue Hospital Medical College, New York, 1868; professor diseases of the throat, 1882-1898 at his alma mater; professor diseases of the throat 1898-1906 and since 1906 professor emeritus at the University and Bellevue Hospital Medical College; consulting physician to the Presbyterian and St. Vincents' hospitals; past president of the American Laryngological Association, and the American Climatological Association; author of the "Handbook of Diseases of the Throat and Nose," "Treatise on Diseases of the Nose and Throat" and other works; aged 82; was found dead in bed, October 17, of accidental asphyxiation.

William Morgan Case Bryan ✠ St. Louis; Johns Hopkins University Medical Department, Baltimore, 1902; formerly instructor in anatomy, ear, nose and throat diseases, St. Louis University School of Medicine, and instructor in clinical laryngology and rhinology at Washington University Medical School, St. Louis; member of the American Academy of Ophthalmology and Oto-Laryngology; at one time on the staffs of the Alexian Brothers' and St. Louis City hospitals; aged 50; died, October 9, following a long illness.

Charles Dennison Smith, Portland, Me.; Medical School of Maine, Portland, 1879; member of the Maine Medical Association; formerly professor of physiology at his alma mater; at one time city physician and president of the state board of health; for many years superintendent of the Maine General Hospital; aged 70; died, October 11.

James Moorhead, Marion, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1893; formerly assistant to the chair of theory and practice, and lecturer on dermatology at his alma mater; member of the board of education; formerly a druggist; aged 75; died, October 11, of cerebral hemorrhage.

Robert Belville Watson, Lock Haven, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1863; member of the Medical Society of the State of Pennsylvania; secretary of the Clinton County Medical Society; Civil War veteran; aged 87; died, October 10, of cholecystitis.

William Stewart I. McDowell, Chicago; Northwestern University Medical School, Chicago, 1891; member of the Illinois State Medical Society; on the staffs of the Washington Park and German Deaconess hospitals; aged 67; died, October 21, of organic heart disease.

John Frederick Herbert ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1883; ophthalmologist to the Abington (Pa.) Memorial Hospital; for several years member of the Cheltenham Township board of health, and board of education; aged 65; died, October 12.

Samuel Woodford Bates ✠ Louisville, Ky.; University of Louisville School of Medicine, 1896; served in the M. C., U. S. Army, during the World War; superintendent of the Kentucky State Tuberculosis Sanatorium, where he died, October 17, aged 51.

G. Oscar Erni, New Albany, Ind.; Louisville (Ky.) Medical College, 1883; formerly professor of general and descriptive anatomy, Southwestern Homeopathic Medical College and Hospital, Louisville; aged 68; died, October 17, of heart disease.

James J. Haralson ✠ Forest, Miss.; Louisville Medical College, 1886; formerly president of the Mississippi State Medical Association and the Scott County Medical Society; member of the state board of health; aged 68; died, October 12.

James Frank Wallis, Washington, D. C.; University of Pennsylvania School of Medicine, Philadelphia, 1895; served in the M. C., U. S. Army, during the World War; aged 58; died, October 15, at Asheville, N. C., following a long illness.

James C. Hay ✠ Laurel, Neb.; University of Manitoba Faculty of Medicine, Edmonton, 1895; president of the Dixon-Cedar-Thurston-Wayne-Dakota Counties Medical Society; aged 64; died, October 12, of pulmonary tuberculosis.

Charles Meredith Garth, Louisville, Ky.; University of Louisville School of Medicine, 1906; member of the Kentucky State Medical Association; served in the M. C., U. S. Army, during the World War; aged 45; died, October 14.

Ray Holly Humphrey ✠ Endicott, N. Y.; Albany Medical College, 1913; physician in charge of a hospital bearing his name; served in the M. C., U. S. Army, during the World War; aged 38; died, October 11, of pneumonia.

Francis Willard St. John ✠ Weedsport, N. Y.; Albany Medical College, 1887; for sixteen years health officer of Weedsport; past president of the Cuyahoga County Medical Society; aged 60; died, suddenly, in October.

Joseph Warren Richardson, Seattle; University of Vermont College of Medicine, Burlington, 1903; member of the Washington State Medical Association; on the staff of the Providence Hospital; aged 45; died, October 8.

George Clifton Hall ✠ Richmond, Va.; Medical School of Harvard University, Boston, 1890; medical director of the Life Insurance Company of Virgina; aged 57; died suddenly, October 12, of cerebral hemorrhage.

Henry Alexander Gribbon ✠ Poughkeepsie, N. Y.; University and Bellevue Hospital Medical College, New York, 1899; on the staff of the Vassar Hospital; aged 48; died, October 18, of heart disease.

Edward Giles McConnell ✠ San Francisco; Cooper Medical College, San Francisco, 1893; member of the American Urological Association; aged 57; died, October 19, of chronic nephritis and uremia.

Charles W. Ely ✠ Cheshire, Ohio; Starling Medical College, Columbus, 1890; aged 57; died, October 11, of a self-inflicted bullet wound, while suffering from chronic nephritis and heart disease.

James Barbour Boldridge, Winston, Va.; College of Physicians and Surgeons, Baltimore, 1893; member of the Medical Society of Virginia; aged 72; died, October 1, at Culpeper, of angina pectoris.

Anna M. A. Hahn, Chester, Ill.; Homeopathic Medical College of Missouri, St. Louis, 1900; Hahnemann Medical College and Hospital, Chicago, 1901; died, October 12, following a long illness.

✠ Indicates "Fellow" of the American Medical Association.

Abram Vernon Hicks, Pittsburgh; University of Pittsburgh School of Medicine, 1907; member of the Medical Society of the State of Pennsylvania; aged 41; died, October 21, of pneumonia.

Jacob Read Lincoln, Millbury, Mass.; Medical School of Harvard University, Boston, 1888; member of the Massachusetts Medical Society; aged 63; died, September 28, of myocarditis.

Abel Anderson, Denton, N. C. (licensed, North Carolina); member of the Medical Society of the State of North Carolina; aged 70; died, October 14, of cerebral hemorrhage.

John J. Valentini, Baltimore; Baltimore University School of Medicine, 1889; formerly a member of the school board; aged 63; died suddenly, October 23, of heart disease.

John Christian Bullitt, Wayne, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1896; aged 53; died, recently, at Vineyard Haven, Mass., of heart disease.

Earl Thomas, Hoxie, Ark.; Washington University Medical School, St. Louis, 1905; member of the Arkansas Medical Society; aged 47; was found dead, October 13.

Lanier Dunn Pole ✠ Hot Springs, Va.; University College of Medicine, Richmond, 1906; aged 41; died suddenly, October 17, near Staunton, of cerebral hemorrhage.

Abel Braslau ✠ New York; Medical Department of the University of the City of New York, 1889; aged 61; died suddenly, October 19, of heart disease.

Lee Victor Knapp, Danbury, N. H.; Baltimore Medical College, 1897; member of the New Hampshire Medical Society; aged 59; died, in October.

Lewis Everhard Sisler, Akron, Ohio; Western Reserve University School of Medicine, Cleveland, 1883; aged 65; died, October 19, of heart disease.

William Powers Crane, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1925; aged 25; died suddenly, October 16.

Dean Gilkey, Walville, Wash.; University of Pennsylvania School of Medicine, Philadelphia, 1918; aged 37; died, October 5, at Eugene, Ore.

William Frank Steer, Cleveland; Cleveland University of Medicine and Surgery, 1896; aged 56; was killed, October 16, in an automobile accident.

H. Powell Luckett, Bastrop, Tex.; University of Louisville (Ky.) School of Medicine, 1867; aged 78; died, October 7, of cerebral hemorrhage.

William T. Pace, Monroe, Ky.; University of Louisville School of Medicine, 1874; aged 78; died, October 16, following a long illness.

Charles Isham, Little Falls, N. Y.; Chicago Medical College, 1865; Civil War veteran; aged 83; died, October 16, at a local hospital.

Clyde Dee Bothwell ✠ Oelwein, Iowa; St. Louis College of Physicians and Surgeons, 1907; aged 42; died, October 19, of heart disease.

Louis Curtis Wood ✠ Poughkeepsie, N. Y.; Bellevue Hospital Medical College, New York, 1881; aged 69; died, September 21.

William Knight, Cincinnati; Medical College of Ohio, Cincinnati, 1875; aged 75; died, October 13, at home in Madeira, Ohio.

Victor Noel, New York; University of Paris, France, 1880; died, September 26, at Nice, France, following a long illness.

John C. Bishop, Gainesville, Fla.; St. Louis (Mo.) College of Physicians and Surgeons, 1891; aged 58; died, October 9.

Thomas Ezra Guild ✠ Boston; University of Vermont College of Medicine, Burlington, 1892; aged 57; died, October 9.

J. Ezra Blanchard, Ozark, Ill.; Eclectic Medical Institute, Cincinnati, 1895; aged 54; died, October 12, of carcinoma.

Clay D. Fellows ✠ Algona, Iowa; Keokuk Medical College, 1892; aged 57; died, October 13, of heart disease.

Herman J. Groesbeck, Cincinnati; Miami Medical College, Cincinnati, 1873; aged 76; died, in October.

Homer H. Pratt ✠ Brookfield, Mo.; Rush Medical College, Chicago, 1872; aged 77; died, October 15.

Francis B. Grew, Hoboken, N. J.; L.R.C.S., Edinburgh, Scotland, 1875; aged 75; died, in October.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

HORSE DUNG ALLERGEN-SQUIBB, HOUSE DUST ALLERGEN-SQUIBB, LE PAGE'S GLUE ALLERGEN-SQUIBB AND STREET DUST ALLERGEN-SQUIBB NOT ACCEPTABLE FOR N. N. R.

Report of the Council on Pharmacy and Chemistry

The Council has authorized publication of the following report.

W. A. PUCKNER, Secretary.

Among the allergic protein preparations of E. R. Squibb & Sons, offered as a means of determining specific hypersensitiveness, are the following: Horse Dung Allergen-Squibb, stated to be the protein from the dung of the horse; House Dust Allergen-Squibb, stated to be the protein from ordinary house dust; Le Page's Glue Allergen-Squibb, the protein isolated from "Le Page's Glue"; Street Dust Allergen-Squibb, stated to be the protein from ordinary street dust.

The composition of house dust varies with the contents of different houses and with their location; therefore the protein obtained from house dust must vary widely. Similarly, the composition of street dust is dependent on the material that goes to make up the dust on streets in different localities. Le Page's Glue is a product of unstandardized composition; hence there is no guarantee that the protein isolated from Le Page's Glue is uniform. As the composition of horse dung, house dust, glue and street dust is indefinite, it is irrational to test the hypersensitivity of a patient by means of a stock preparation; instead, an extract should be prepared from material which is likely to correspond with that to which the patient is sensitive.

In consideration of their indefinite composition, the Council finds Horse Dung Allergen-Squibb, House Dust Allergen-Squibb, Le Page's Glue Allergen-Squibb and Street Dust Allergen-Squibb unacceptable for New and Nonofficial Remedies.

VITANOL NOT ACCEPTABLE FOR N. N. R.

Report of the Council on Pharmacy and Chemistry

The Council has authorized publication of the statement that follows.

W. A. PUCKNER, Secretary.

Vitanol (Daub Chemical Company, Brooklyn), "The all-year-round tonic" is stated to have the following composition:

"Egg Yolk 8%, Lecithin 1.5%, Hemoglobin 1.5%, Ferri Albuminate 1.5%, Cod Liver Oil 25%, Glycerin 9.5%. Vehicle used contains sugar, terpenless oil of lemon, and whiskey giving an alcoholic equivalent of 20%."

This alcoholic "tonic" is exploited with unwarranted therapeutic claims, such as these:

"Just what the body needs."

"It supplies the human cell what it needs to properly function. In other words, an Ideal Vitamin Emulsion which supplies the physiological and biological requirements of life."

"Bodily functions are greatly stimulated with Vitanol due to the fact that it augments the body heat."

The following recommendations for the use of Vitanol appear on the trade package:

"Indicated in the treatment of influenza, malnutrition, chlorosis, anemia, general debility, nervous disorders, coughs, colds, pulmonary diseases, lowered vitality and allied diseases."

The information submitted to the Council does not show that the vitamin potency of the mixture is determined or that the quality of the lecithin, hemoglobin, "ferri albuminate" or cod liver oil is controlled. Vitanol, being a complex, irrational mixture of uncontrolled composition, marketed with unwarranted therapeutic claims and in a way to invite its indiscriminate and ill advised use by the public, is inadmissible to New and Nonofficial Remedies.

Correspondence

MORTALITY FROM CANCER

To the Editor:—Referring to the editorial comment (THE JOURNAL, October 17, p. 1224) on my article on cancer mortality in the ten original registration states: In the course of the preparation of the bulletin of which this article is a summary, I, too, was struck by the apparent discrepancy between my conclusions for the ten original registration states and those arrived at by Dr. William T. Howard in his study of the statistics of the city of Baltimore (THE JOURNAL, Jan. 13, 1923, p. 71). This apparent discrepancy led me, of course, to careful study of Dr. Howard's article.

From internal evidence in the article itself, it was apparent that the figures and the rates published were erroneous and, therefore, the conclusions based thereon could not be correct. In his article, Dr. Howard publishes the following table for the city of Baltimore:

Number of Deaths and Rate of Death per Hundred Thousand Living Female Inhabitants 40 Years of Age and Over, from Cancer of the Breast and Uterus, for the Census Years 1880 to 1920, Inclusive

Year	Total		Breast		Uterus	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1880	94	61	37	24	57	37
1890	158	76	50	24	108	52
1900	161	64	52	20	109	43
1910	199	65	74	24	125	41
1920	205	48	80	18	125	30

From his table the following conclusion is drawn:

> From these data, it appears that after 1880 there was no increase in mortality from cancer of the breast, and since 1890 from cancer of the uterus, and from cancer of these two organs taken together. Thus, when rates that approach specificity are obtained, in respect to cancer of these two organs, in which disease in fatal stages is readily diagnosable, an apparent increase in mortality is converted into an actual decrease. Therefore, it seems to be established that during the last forty years, cancer of the breast and uterus (including the other female organs of generation) has shown no real advance in mortality, and that there is a considerable margin of reduction, especially in respect of the latter category, to be placed to the credit of surgical intervention.

On comparing the rates shown in this table with rates that had been computed for cancer of the breast and cancer of the female genital organs for the female population of 35 years and over of the ten original registration states, it was noted that the rates given in Howard's table were abnormally low, only from about one half to one third of the rates found in this population for the registration states of 1900 (e. g., the death rate from cancer of the breast in the female population of 35 years and over of the ten original registration states was 46.4 per hundred thousand in 1910 and 54.0 per hundred thousand in 1920, as compared with the respective rates in Howard's table of 24 and 18). Evidently there was some error in the population figures for females 40 years and over for the city of Baltimore, by which these rates were computed.

The U. S. Census Reports give the following figures for the female population 40 years and over for that city:

Year	Female Population, 40 Years and Over
1880	40,936
1890	59,278
1900	66,811
1910	80,079
1920	106,902

Applying these figures to the number of deaths from cancer of the breast and of the uterus, as given for Baltimore by Howard, the following table is obtained:

Year	Female Population 40 Years and Over	Total		Breast		Uterus	
		Deaths	Rate	Deaths	Rate	Deaths	Rate
1880	40,936	94	230	37	90	57	139
1890	59,278	158	267	50	84	108	182
1900	66,811	161	241	52	78	109	163
1910	80,079	199	249	74	92	125	156
1920	106,902	205	192	80	75	125	117

This recomputation, using enumerated figures, gives much higher rates. In fact, some of them are now apparently too high. For instance, the combined rate for Baltimore in 1910 for cancer of the breast and of the uterus is over twice as high as the computed rate (116.4) for the female population 35 years and over of the ten original registration states.

The following table, which shows the actual deaths in the city of Baltimore for the period 1900-1920, was compiled from the deaths from cancer of the breast and cancer of the female genital organs that were furnished me by Dr. W. H. Davis, chief statistician of the Division of Vital Statistics, Bureau of the Census. The rates were computed for the female population 40 years and over from the population figures given for the city of Baltimore by specific age groups in the reports of the Cenus Bureau, 1900, 1910 and 1920, the intercensal years being estimated by the usual arithmetical method.

Deaths in City of Baltimore, 1900-1920

Year	Cancer of Breast		Cancer of Female Genital Organs		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1900	26	39	70	105	96	144
1901	45	66	69	101	114	167
1902	45	65	72	105	117	168
1903	31	44	73	103	104	147
1904	52	72	74	103	126	175
1905	43	59	73	99	116	158
1906	51	68	78	104	129	172
1907	41	54	91	119	132	173
1908	44	57	81	105	125	161
1909	44	56	81	103	125	159
1910	54	67	95	119	149	186
1911	62	83	74	99	136	182
1912	65	76	99	116	164	192
1913	50	57	104	118	154	175
1914	65	72	104	114	169	186
1915	55	59	97	104	152	163
1916	74	77	105	109	179	186
1917	42	43	97	98	139	140
1918	65	64	101	99	166	163
1919	87	83	122	117	209	200
1920	65	61	125	117	190	178

On comparing the years 1900, 1910, 1920 as was done by Dr. Howard, using the average of the first two and the last two years, and of the three years, 1909, 1910, 1911,

Year	Cancer of Breast		Cancer of Female Genital Organs		Total	
	Breast	Rate	Deaths	Rate	Deaths	Rate
1900	35	52	69	102	105	155
1910	50	62	83	103	133	165
1920	75	72	123	117	199	189

it is evident that there has been a considerable increase in the death rate from cancer of the breast amounting to 38 per cent., and from cancer of the female genital organs, 15 per cent. The combined rate of increase for these two forms of cancer is 22 per cent. This is, of course, by no means comparable with the much greater percentage increase that has been registered in the mortality figures of the ten original registration states. The situation, however, is far different

from the pronounced decline of nearly 33 per cent. in the combined death rate for cancer of the breast and cancer of the female genital organs shown in Dr. Howard's table.

Evidently this explanation clears up the apparent discrepancy between Dr. Howard's conclusions and my own.

J. W. SCHERESCHEWSKY, M.D., Boston.
Surgeon, in Charge, Field Investigations of Cancer, U. S. Public Health Service.

"DIATHERMY IN CALCIFIED SUBDELTOID BURSITIS"

To the Editor:—Arthur L. Fisher (THE JOURNAL, October 24, p. 1324), San Francisco, takes good exception to the article on "Action of Diathermy in Calcified Subdeltoid Bursitis," by Dr. Joseph F. Harris (THE JOURNAL, October 10, p. 1134). In that article Dr. Harris reports only one case. Dr. Fisher also cites the well known occurrence that for some unknown reason the calcification of bursae sometimes disappears without treatment. This could hardly be the situation with Dr. Harris' case, the symptoms of which condition existed seven years.

I have had a few cases of this condition to treat in which diathermy plus static brush discharge has been used, and at the meeting of the American Academy of Physiotherapy in New York during September, 1923, eleven such cases were reported. All the roentgenograms and their diagnoses, both before and after treatment, were made outside my office, some of them having been made at the Presbyterian Hospital, New York. All these cases were of long standing, and it was felt that while diathermy and static electricity did not effect a "cure," they certainly helped awaken a reaction in the body which promoted the absorption of the calcium and assisted the patient in recovering from the condition himself. Physiotherapy in all its branches is very rarely a curative method, but it does seem to convert an inadequate reaction on the part of the individual into one that is adequate to overcome the pathologic condition.

NORMAN E. TITUS, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ROENTGEN RAYS AND STERILITY

To the Editor:—Are there any facts to substantiate the belief that roentgenologists are liable to sterility? Are there any reliable reports of sterility occurring in roentgenologists in this country and can you give me the references? What procedure should be adopted to determine sterility in the male, if it is suspected? What are the characteristics of the spermatic fluid in cases of roentgen-ray sterility?

M.D., Minneapolis.

ANSWER.—The general subject of sterility induced by roentgen rays has been dealt with in THE JOURNAL from time to time:

Roentgen Rays and Sterility, Current Comment, THE JOURNAL, Nov. 11, 1922, p. 1692.
DeVilbiss, Lydia Allen: Roentgen Rays and Sterility, THE JOURNAL, Dec. 23, 1922, p. 2184.
Roentgen-Ray Sterilization, Queries and Minor Notes, THE JOURNAL, Oct. 3, 1925, p. 1082.

In most cases the sterilization is only temporary. The time of recuperation depends on the intensity of the treatment and on the individual constitution. Neither roentgen-ray nor operative sterilization necessarily affects the libido. There is no specific treatment for roentgen-ray sterility in the male. Absolute removal from the influence of roentgen rays and general hygienic measures are essential.

Furthermore, full discussion of the phases of the subject that interest our correspondent can be found by consulting the book by Sinclair Tousey, "Medical Electricity, Roentgen Rays and Radium," Edition 3, 1921, and by following out the references he gives. However, the following quotation may be of interest in answer to the four questions:

"Repeated mild exposures of the ovary or testis are quite generally regarded as productive of sterility. In the case of x-ray operators, the loss of the power of motion in the spermatozoa, and in some cases absence of the spermatozoa, has been demonstrated a great many times by the microscope. The fact was first published by Tilden Brown and A. T. Osgood of New York. This is not accompanied by any sexual impotence, and it is doubtless not permanent, but a condition which disappears after the exposures have been discontinued or protection by a proper apron or shield has been adopted. This necrospermia may develop in any one who spends much time in an x-ray room where no precautions are taken to limit the rays to some one particular direction. . . . The author knows of cases in which physicians working much with the x-ray without adequate protection have been found to have complete necrospermia and apparent azoospermia, and in whom a vacation, and the subsequent use of a heavy apron of rubber loaded with baryta, and an efficient shield around the x-ray tube, have been followed by the reappearance of living spermatozoa, and the men have had children."

NEW AND OLD HAINES' TEST

To the Editor:—Is there a table by which a person using a certain number of drops of urine to a given amount of Haines' solution can tell approximately the percentage of sugar?

E. L., M.D., Rockford, Ill.

To the Editor:—What are the directions for the old and new Haines' solutions for testing urine for presence of sugar? How does the new solution differ from the old?

H. E. B., M.D., Ohio.

ANSWER.—Neither Haines' solution nor Haines' solution modified is adaptable for approximate determinations of sugar by the drop method. Furthermore, the size of drops from different types of delivery tubes varies greatly in amount so that it is much better to employ metric measurement (cubic centimeters) if quantitative data are desired. The directions for the Haines' solution modified (which is a *qualitative* test) are: "Heat about 5 c.c. of the copper solution to boiling in a test tube, remove from the flame, and hold at an angle of 30 to 40 degrees. To this add, by means of a medicine dropper, 10 to 20 drops of the urine (freed from phosphates) in such a manner that a distinct zone of contact is formed between the copper solution and the urine. The tube is then placed in the upright position and the reaction noted. If sugar is present in quantities exceeding 0.1 per cent., a brick-red or yellowish ring will immediately appear at the junction of the two liquids. If the amount of sugar be less than 0.1 per cent., the ring will appear in from a few seconds to slightly less than a minute, the smaller quantities showing slower reactions with a tendency to a more yellowish color of the ring. In urines containing no sugar, no ring of any kind will be noted at the zone of contact" (Haines, W. S.; Pond, G. P., and Webster, R. W.: Improved Test for Detection of Glucoses, Especially in Urine, THE JOURNAL, Jan. 31, 1920, p. 301). It will be noticed that the directions preclude the addition "drop by drop," as thereby the two liquids would mix; also the relative degree of pathologic sugar is indicated by the time and color of the ring, and not by the amount of urine employed. It is important that phosphates be removed from the urine in order to avoid wrong interpretations. The A. M. A. Chemical Laboratory has seen instances in which a physician, using this test, reported sugar present when in reality it was absent, owing to not removing the phosphates; the resulting phosphate precipitate was misinterpreted as a positive test for sugar.

In the original Haines' test (qualitative) the technic is different, particularly in that the urine and solution are mixed, then heated and only 6 drops of suspected urine is employed. The directions are: "Four or five c.c. of this solution are placed in a test-tube and gently boiled. Six drops of the suspected urine are added and the upper portion of the mixture brought to a boil and immediately removed from the flame. If sugar be present an abundant yellow or yellowish-red precipitate is thrown down; if no such precipitate occurs sugar is absent. The precautions to be observed in using this test are never to add at the outside more than 10 drops of urine and not to boil the mixture for more than one or two seconds after the addition of urine" (Webster: Diagnostic Methods, Philadelphia, P. Blakiston's Son & Co., 1923, p. 323).

The determination of the sugar quantitatively by means of a pipet or buret is not difficult and much more satisfactory,

The original Haines' solution, which is a modification of Trommer's test, consists of:

Copper sulphate	12 gm.
Sodium hydroxid	32 gm.
Glycerin	90 c.c.
Water.....to make	1,000 c.c.

The composition of the modified Haines' solution is:

Copper sulphate	5 gm.
Glycerin	250 c.c.
Sodium hydroxid	14.3 gm.
Water.....to make	1,000 c.c.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARKANSAS: Little Rock, Nov. 10-11. Sec., Reg. Bd., Dr. J. W. Walker, Fayetteville.

CONNECTICUT: New Haven, Nov. 10. Sec., Reg. Bd., Dr. Robert L. Rowley, 79 Elm St., Hartford; Sec., Homeo. Bd., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DELAWARE: Wilmington, Dec. 8-9-10. Pres. Med. Coun., Dr. Henry W. Briggs, 1026 Jackson St., Wilmington.

MAINE: Portland, Nov. 10-11. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: Baltimore, Dec. 8-11. Sec., Reg. Bd., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore, Sec., Homeo. Bd., Dr. J. S. Garrison, 517 Old Orchard Rd., Baltimore.

MASSACHUSETTS: Boston, Nov. 10-12. Sec., Dr. Frank M. Vaughan, 144 State House, Boston.

NORTH CAROLINA: Raleigh, Nov. 25 (Endorsement of Credentials only). Sec., Dr. Kemp P. B. Bonner, Morehead City.

OHIO: Columbus, Dec. 2-4. Sec., Dr. H. M. Platter, Hartman Hotel Bldg., Columbus.

PHILIPPINE ISLANDS: Manila, Nov. 10. Sec., Dr. Jose V. Gloria, 686 Rizal Ave., Manila.

SOUTH CAROLINA: Columbia, Nov. 10. Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

TEXAS: Dallas, Nov. 17-19. Sec., Dr. T. J. Crowe, 918-919 Mercantile Bank Bldg., Dallas.

VIRGINIA: Richmond, Dec. 8-11. Sec., Dr. J. W. Preston, 720 Shenandoah Life Bldg., Roanoke.

Mississippi June Examination

Dr. F. J. Underwood, secretary of the Mississippi Board of Health, reports the written examination held at Jackson, June 23-24, 1925. The examination covered 12 subjects, and included 96 questions. An average of 75 per cent. was required to pass. Twenty-eight candidates, including two undergraduates, were examined, all of whom passed. Thirteen candidates were licensed by reciprocity. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
Emory University School of Medicine	(1925)	84
Northwestern University Medical School	(1925)	82.2, 88.6
Tulane University of Louisiana School of Medicine (1925) 82.7, 86.6, 87, 88.4, 88.8, 90, 92	(1920)	92.5,
St. Louis University School of Medicine	(1925)	84.5
University of Pennsylvania School of Medicine 87, 88.2, 90.3, 92, (1925) 82.4	(1919)	84.3,
Meharry Medical College	(1922)	84.3
University of Tennessee College of Medicine	(1925)	83.3, 86.7, 87
Vanderbilt University School of Medicine	(1925)	87.5
University of Virginia Department of Medicine	(1925)	80, 83.5, 92
Undergraduates		75.4 78.2

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
University of Arkansas Medical Department	(1916)	Louisiana
Emory University School of Medicine	(1922)	Georgia
Medical College of Louisiana	(1898)	Louisiana
Tulane University of Louisiana School of Medicine (1923) Louisiana	(1921)	Alabama
St. Louis College of Physicians and Surgeons	(1907)	Illinois
Meharry Medical College	(1913), (1914)	Tennessee
Memphis Hospital Medical College (1912) Tennessee	(1899), (1905)	Arkansas
University of Tennessee College of Medicine	(1921)	Tennessee
University of Virginia Department of Medicine	(1924)	Virginia

Oklahoma June Examination

Dr. J. M. Byrum, secretary of the Oklahoma Board of Medical Examiners, reports the written examination, held at Oklahoma City, June 16-17, 1925. The examination covered 12 subjects and included 120 questions. An average of 75 per cent. was required to pass. Thirty-three candidates took the examination and all of them passed. Eleven candidates were licensed by reciprocity, and two were granted reregistration certificates. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
Northwestern University Medical School	(1924)	89
University of Louisville School of Medicine	(1924)	90
Washington University School of Medicine	(1924)	85
Creighton Medical College	(1923)	87
University of Oklahoma School of Medicine 82, 82, 83, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 86, 87, 87, 87, 87, 88, 88, 88, 89, 89, 90, 90	(1924) 84, (1925)	81,
University of Manitoba Faculty of Medicine	(1923)	88

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
University of Louisville School of Medicine	(1920)	Texas
St. Louis University School of Medicine	(1924)	Missouri
University Medical College of Kansas City	(1906)	Kansas
Washington University School of Medicine	(1924)	Missouri
Memphis Hospital Medical College	(1912)	Arkansas
University of the South Medical Department	(1898)	Kansas
Vanderbilt University School of Medicine	(1922), (1923)	Tennessee
Baylor University College of Medicine	(1924)	Texas
University of Texas Department of Medicine	(1924)	Texas
University of Virginia Department of Medicine	(1920)	Mississippi

Book Notices

THE MEDICAL FOLLIES. An Analysis of the Foibles of Some Healing Cults, Including Osteopathy, Homeopathy, Chiropractic, and the Electronic Reactions of Abrams, with Essays on the Antivivisectionists, Health Legislation, Physical Culture, Birth Control and Rejuvenation. By Morris Fishbein, M.D., Editor of the Journal of the American Medical Association. Cloth. Price, $2. Pp. 223. New York: Boni and Liveright, 1925.

This volume by the editor of THE JOURNAL, is a collection of articles published during the last two years in such periodicals as the *American Mercury*, the *Haldeman-Julius Monthly*, *Hygeia* and THE JOURNAL, together with some essays not previously in print. The essays are arranged in chronological order, beginning with the tractors of Elisha Perkins, passing through homeopathy, osteopathy and chiropractic to the Abrams fad, and including also material on health legislation, birth control, animal experimentation, physical culture and the medicine of the press. The volume has been greeted by literary critics with rather general approval. The recognition accorded to the book is an indication of the fact that American journalism today looks to the American Medical Association for authoritative statements in matters of scientific medicine and public health. As an indication, we include statements from current reviews.

The New York *Times* said, in part:

> The rise and fall of the various fads and fancies of medicine as evolved by advocates of preposterous and fallacious theories, some of which were conceived for the purpose of deliberate fraud and others in the uncurbed delusions of fanatics, and all against the "peace and dignity" and the health of the public, are explained with a clarity and convincing logic that leaves little room for argument. . . .
>
> It may as well be said at once that in this volume Dr. Fishbein has done a great service to the cause of scientific medicine.

The Brooklyn *Eagle* said:

> The guardian text of the good doctor is that health systems come and go, but the medical doctors go on forever. . . .
>
> The practice of medicine made such rapid strides during the war that the public is willing to accept almost anything that appears to have a medical label. Dr. Fishbein realizes this. His book is a valuable aid in separating the real from the fake . . . I know of no more readable book of nonfiction.

The Chicago *Post* said, in part:

> When the antimedical crowd criticize the medical profession as a trust, they omit one important point; and that is that the medical profession, if it be a trust, is an open one. Nobody can be kept out who wants to get in. All he has to do is to prove that he has studied the human body, knows therapy, and has a proper educational background. The reviewer is a believer in individualism and freedom. But the less "medical freedom," in the sense in which the propagandists for it use that phrase, we have, the safer he will feel for himself, his children and his friends.

The New York *Post* said:

> Dr. Fishbein writes amusingly and readably; he swings a vigorous club, and when he comes to such absurdities as "The Big Muscle Boys" he scores with every swing. Just what good a book of this sort will do is open to question: There will be cults and followers for them as long as mankind lasts. But it is interestipg reading, and Dr. Fishbein has done his part admirably.

The New York *Sun* said:

In "The Medical Follies" (Boni & Liveright, $2) he sets fire to the shirts of charlatans with tremendous relish and gusto.

Everything about his style is in his favor. He is so plain that no intelligent layman will have any difficulty in following him. He is so vigorous that the reader is swept along by the flood. Finally, though a book like this is a tremendous public service, it is quite obvious that with Dr. Fishbein it was not primarily written from any solemn sense of duty. Against the frauds who prey upon the public he does not use the weapon of righteous indignation, but the weapon of derision. One feels that he waves his battle ax around his head not because it is a service to the state, but because there is a glorious zest in crushing the skulls of quacks. This department leaves it to specialists to say whether every statement he makes may be indorsed; but to watch him at his work is as exhilarating as watching a bull-fight.

The Richmond *News Leader* said:

The broom is at its most effective point in the essays of "The Medical Follies." The quacks who operate on the shady borderline of the medical profession, taking millions and injuring the cause of authentic science, have never before had to deal with so devastating an offensive.

However, not all of the response has been so favorable. One O. O. M'Intyre, conducting a syndicated column, remarks:

"The Medical Follies," by a Dr. Morris Fishbein, is a stupidly written and unnecessary book. It is an old school practitioner sneering at the new schools and its unconscious venom reveals its obvious propaganda. As one reviewer notes: "Let Dr. Fishbein cure whooping cough, then he may impress us more with the surety of his medical views."

An osteopath, W. E. Farbstein, replied to favorable criticism in the *Haldeman-Julius Weekly*, as follows:

Why didn't Fishbein, if he were an honest man, publish a chapter on Medicine and Surgery Full of Quackery Today? He has criticised every form of therapy but his own, allopathy, which deserve criticism the most.

Medicine and surgery, as practiced today, is 90 per cent. bunk. Cabot, America's premier diagnostician, of the Harvard Medical College, a few years ago stated that 50 per cent. of his diagnoses were incorrect, when checked up by postmortem.

Osler, the greatest of modern times, was almost a therapeutic nihilist. He said there were less than six drugs of value in the whole Pharmacopeia, also that 80 per cent. or more of sick folks would get well just as quick or quicker without any medical treatment.

In the meantime the publisher has made three printings of the volume and it seems to be accomplishing its purpose.

CLINIQUE MÉDICALE DES ENFANTS. Affections de l'appareil circulatoire. Par P. Nobécourt, Professeur de clinique médicale des enfants a la Faculté de médecine de Paris. Paper. Price, 25 francs. Pp. 371, with 122 illustrations. Paris: Masson et Cie, 1925.

No greater service can be rendered by a clinician of large experience than to record, after many years of labor among the sick, his observations and deductions. This Nobecourt has done in an admirable way in this monograph. He considers the various cardiac affections of infancy and childhood, and each chapter is devoted to a particular phase of the subject. He introduces his clinical treatise by citing the history of several patients, and proceeds with an analytic discussion of the patients and the subject in general. His reference to his own vast experience, as well as to the literature in general, makes the book of added value. There are charts and ortho-diagrams. The modern methods of heart diagnosis are presented and stressed, and the suggestions for treatment are rational and valuable. The book will be of great interest to pediatricians and those who treat the cardiac diseases of young life. Not least, the observations and the clinical reflections of a keen and industrious clinician are preserved in the form of a permanent and very readable record.

INTERNAL SECRETION IN HEALTH AND DISEASE. By Capt. Y. M. Bose, M.D. Cloth. Price, Rs. 12 net. Pp. 550, with 43 illustrations. Calcutta: Butterworth & Co. (India), Ltd., 1925.

This is a curious and disappointing volume on endocrinology. In the preface the author makes the following candid confession: "The writer does not claim any original research and study on the subject, but has tried to put together the important connecting links of the various problems of internal secretion so as to make the subject clearly understood by any busy practitioner or a student." Why a physician who has made no specific research or study on the difficult subject of the endocrines in health and disease should proceed to write a volume on the subject for the information and instruction of students and physicians is certainly not clear. The author says further, "As far as possible all controversal discussions have been avoided." That would lead one to infer that all the matters set forth in the book are accepted, proved and undisputed facts, when, as a matter of fact, the book is full of errors, misleading statements and unproved assertions. The author gives evidence of quite extensive reading in the field of endocrinology; occasionally he shows discrimination and judgment, but more often purile credulity. The book contains the conventional chapters on endocrines and endocrine diseases. There is a chapter headed "Glossary of Endocrine Diseases and their Treatment" from which we quote:

Asphyxia is relieved promptly by adrenalin with saline solution intravenously.

Cataract is considered to be arrested by thyroid with adrenal gland and iodides.

Bronchitis (chronic) responds to thyroid with creosote preparations, in addition to other remedial measures, especially suitable vaccine.

Eczema is often the result of defective protein catabolism with correlated endocrine dysfunction and auto-intoxication. A week's strict vegetable diet should be followed by thyroid and pituitary.

Fractures get easily united when calcium lactate and thymus are given with meals, and strychnine, thyroid and pituitary after meals.

Mania is due to hyperendocrin condition.

Neurasthenia is relieved by strychnine, thyroid and pituitary.

On page 55 we are told that the "thymus controls the infancy when by its inhibitory action on the other internal secretions the baby is allowed to grow in bulk without much differentiation. . . . The pineal rules the childhood. . . . During the mature period the three important glands, pituitary, thyroid and adrenals, between themselves control the personality, both bodily and mentally, of the man. Senility is due to general endocrin deficiency." On page 58 the author states under the heading Therapeutic Value of Hormones: "It cannot be said that much has been accomplished with organotherapy except in a few instances such as the use of thyroid in myxedema. It is unfortunately common for a present day clinician to take a chance-hit with the much boomed organotherapeutic shot-gun." Then he proceeds to quote with approval Cushing's caustic remarks on the follies of present day organotherapy. And yet in subsequent parts of the book the author completely abandons this attitude and says (p. 481): "The administration of endocrin products by mouth is considered to be practical, for most of these extracts are effective in this way." On page 470 the author states that the administration of the extract of an organ specifically stimulates this organ in the patient, and that this law appears to be general. In other words, he accepts the hypothesis of homostimulation as a demonstrated law. The book cannot be recommended for the information and guidance of either students or practitioners. It is more misleading than informational.

LES SYNDROMES RESPIRATOIRES. Par Émile Sergent, Professeur à la Faculté de médecine de Paris. Deuxième fascicule. Bibliothèque des grands syndromes. Directeur H. Roger, Doyen de la Faculté de médecine de Paris. Paper. Price, 20 francs. Pp. 489, with 98 illustrations. Paris: Gaston Doin, 1925.

This is an excellent presentation of the etiology, diagnosis, prognosis and treatment of various disturbances of the mediastinum, the diaphragm, the pleura and the lungs. The section on diseases of the mediastinum covers 150 pages. The section on the diaphragm is briefer; the section on the pleura and that on the lungs cover 100 pages each. Seventy-six of the illustrations are reproductions of roentgenograms of patients illustrating the various types of disorders. Great emphasis is laid on the roentgen ray in diagnosis of the disorders treated. Comments on therapy are very brief. The volume is a serious and valuable study on the diseases of the chest.

VITAL CAPACITY OF THE LUNGS. A Handbook for Clinicians and Others Interested in the Examination of the Heart and Lungs Both in Health and Disease. By J. A. Myers, M.S., Ph.D., M.D., Assistant Professor of Preventive Medicine and Public Health, Medical and Graduate Schools, University of Minnesota. With introduction by S. Marx White, B.S., M.D., F.A.C.P., Professor of Medicine and Chief of the Department of Medicine, University of Minnesota. Cloth. Price, $3.25. Pp. 140, with 32 illustrations. Baltimore: Williams & Wilkins Company, 1925.

Internists, teachers of physical education, and investigators will welcome this concise, accurate and conservative monograph. The author has attempted to bring together the chief facts which we now possess concerning the normal vital

capacity and its variations in health and in disease, making these data available without the use of any mathematical calculations or an understanding of the mathematical formulas from which the tables are derived. The six chapters deal in turn with the history of the study of vital capacity; factors other than disease which influence the normal capacity; the influence of disease on the vital capacity; some limitations of the vital capacity as a clinical test for disease or as a test for physical fitness; measurements and instruments used in the vital capacity test, and, finally, normal vital capacity standards. The presentation is clear, concise and conservative. No one will take issue with the following conclusion (p. 81):

I do not wish to leave any reader with the impression that the vital capacity test is infallible or that it should replace any part of the physical or x-ray examinations as they are used today. But the laboratory, physical and x-ray examinations are all subject to error. In fact, diagnosis of disease rarely should be made on a single phase of an examination, but all possible information should be obtained from every available source before a patient is told that disease does or does not exist in his body. In such a complete examination the vital lung capacity test is fully entitled to a place.

MÉDICAMENTS ET MEDICATIONS CARDIAQUES. Par H. Vaquez, Professeur a la Faculté de médecine de Paris. Leçons recueillies par M. Théodoresco. Cloth. Pp. 302. Paris: J.-B. Baillière et Fils, 1925.

There are twelve lectures by Vaquez reported by his intern Théodoresco. Several drugs are discussed, digitalis, strophanthus and quinidin being considered quite fully. The clear style and orderly arrangement make for easy reading. The historical introductory pages add much that is of value. In the first half of the volume the approach to the subject is by way of the drug. In the last half it is by way of the different diseases, there being considered the treatment of such affections as the acute cardiopathies, the arrhythmias, hypertension and angina pectoris. While Vaquez is rather optimistic as to therapy and while one may not always agree with his views, no one can read the book without a lively interest and without receiving many valuable suggestions as to the practical treatment of diseases of the heart.

TEXTBOOK OF DIFFERENTIAL DIAGNOSIS OF INTERNAL MEDICINE. By M. Matthes, M.D., Professor of Medicine and Director of the Medical Clinic, University of Königsberg. Authorized translation of the fourth German edition with extensive additions, by L. W. Held, M.D., and M. H. Gross, M.D. Cloth. Price, $12. Pp. 908, with 176 illustrations. Philadelphia: P. Blakiston's Son & Co., 1925.

Differential diagnosis is obviously one of the most important phases of medical practice. It demands a broad knowledge of numerous diseases. In the review of the second German edition of Matthes' textbook, THE JOURNAL recommended an early English translation because of the systematic, concise presentation and the completeness. The English edition is made from the fourth German edition, bringing the literature quite up to date. Moreover, the translators have added to the sections on influenza, circulatory diseases, roentgen-ray diagnosis and chronic appendicitis, so as to give full value to recent American observations in these fields. The additions by the translators and editors of this volume make what was, in the German edition, a superior book, in the American edition, a superlative one.

THÉORIE DES VITAMINES ET SES APPLICATIONS. ESSAIS DE VITAMINOLOGIE. Par Jean Lorenzini, Docteur en chimie appliquée de la Faculté de Pavie. Avec préface de Charles Richet. Paper. Price, 8 francs. Pp. 88, with 28 illustrations. Paris: Masson et Cie, 1925.

This is an excellent critical summary of the present status of the vitamin problem. The author is catholic in his familiarity with the literature in all languages. The bibliography, however, is incomplete. There are some good photographic illustrations of typical vitamin deficiencies in man and in animals. In the preface to the volume, the physiologist Richet of the University of Paris states that the present volume is really complementary to the volume on the vitamins published by Dr. Berg in Germany three years ago. Dr. Berg in his monograph dealt particularly with the relation of the vitamins to mineral metabolism. Lorenzini's volume deals also with this problem but, in addition, sums up briefly our present knowledge concerning the rôle of the vitamins in all phases of nutrition and metabolism. The volume is a useful and valuable contribution to medicine.

Medicolegal

Phosphorus Poisoning an Accidental Injury

(Victory Sparkler & Specialty Co. v. Francks (Md.), 128 Atl. R. 635)

The Court of Appeals of Maryland, in reversing a judgment for $22,500 recovered against the defendant company for the benefit of a young girl who had contracted phosphorus poisoning while employed in the making of fireworks for the company, says that the lower court held the disease of phosphorus poisoning to be an injury outside the purview of the workmen's compensation act of Maryland; and that the employer was liable, for this injury, at common law. But the court of appeals holds that the girl had sustained an injury arising out of and in the course of an extrahazardous occupation, and that her sole remedy was under the terms of the workmen's compensation act.

The most that was warranted to be inferred from the allegations of fact in the declaration was that the phosphorus poisoning alleged was the gradual result of the negligence of the employer. As this negligence was a breach of duty to her, it was not to be foreseen or expected by the worker as something which would occur in the course of her employment. The fact that she continued at her place of labor, in the doing of her common and regular task, made it clear that the phosphorus poisoning happened without her design or expectation, and so her injury was accidental. It was by chance that the employer did not use due care, and by chance that the vapor of phosphorus was where its noxious foreign particles could be inhaled by the girl. It was by chance that the inspired air carried these particles into her system, sickening her, and causing a necrosis of the jaw after fortuitously finding a lesion. The injury thus inflicted on her body was accidental by every test of the word, and its accidental nature was not lost by calling the consequential results a disease.

Nor could the fundamentally accidental nature of the injury be altered by the consideration that the infection was gradual throughout an indefinite period, as this simply implied a slow development of the malady, or that, instead of a single accidental injury, there was a succession or series of accidental injuries culminating in the same consequential results. The introduction of phosphorus into the human body is none the less accidental, if through the medium of a pimple point, an unsound tooth, a scratch, a lesion, or of ingestion or in breathing. Nor is the accidental nature of this introduction lessened by the length of time intervening between the reception of the poisonous substance and the first manifestation of the resultant poisoning, as its progress may be slow, moderate or rapid, according to the form it assumes. The infection is the accidental injury, and whatever follows in causal connection are but consequences, which measure the duration and effect of the injury. The phosphorus poisoning of the employee as described in the declaration was therefore not a disease incident to the industry, but was an injury in causal connection with her employment, within the meaning of the act defining injury to "mean only accidental injuries arising out of and in the course of employment and such disease or infection as may naturally result therefrom."

Relatives of Patient as Accomplices of Practitioner

(People v. Albrexstondare (Calif.), 235 Pac. R. 87)

The District Court of Appeal of California, Second District, Division 1, says that the defendant contended that the several members of the family of the patient, having prior knowledge of the fact that the defendant was not a licensed medical practitioner within the state, and they with such knowledge having cooperated with him in the treatment of the patient, these facts brought them within the rule that one who in any manner, knowingly and with criminal intent, aids and abets another in the commission of a criminal act is as guilty of the offense as is the person who actually commits it, and consequently that the members of the family who, with such knowledge of the facts, assisted the defendant in the treatment of the patient were accomplices of the defendant, and

that their testimony was subject to the statute which required that before the defendant could be convicted on the testimony of accomplices it was necessary that it be corroborated by evidence which tended to connect the defendant with the commission of the offense.

It is apparent that if the members of the family of the patient in good faith believed that the defendant was a physician and licensed by the state board of medical examiners to act as such, their cooperation with him in treating the patient would not have been criminal. Their knowledge of his lack of statutory qualifications in the premises was prerequisite to any constructive criminal intent on their part. Assuming such actual knowledge by the members of the family, and constructive knowledge on their part that the law forbade any one to treat the sick without having a valid unrevoked certificate of license from the board of medical examiners, it would seem probable that they occupied a position not differing in the law from that occupied by any person not a member of the patient's family who assisted in such treatment. However, while evidence should have been admitted touching the complicity of several of the witnesses with the defendant in the commission of the offense, and in such event the jury properly instructed regarding such evidence, because of the fact that the remaining evidence in the case was so strong that in the absence of any contradictory evidence, without a violation of their oaths, the jury could not do otherwise than find the defendant guilty, his appeal in that regard must be considered as though such errors had not occurred. Moreover, whether or not he received any consideration in compensation for his services as a physician was of no consequence, so far as establishing the violation of the terms of the penal statute was concerned.

On a judgment of conviction being affirmed, the defendant petitioned to have the cause heard and determined by the Supreme Court of California. The latter court, in denying the petition, says that it neither approves nor disapproves the conclusion of the district court of appeal that under the circumstances outlined in the opinion the members of the patient's family would be accomplices, if they had knowledge of the fact that the defendant did not have a license to practice medicine. The supreme court does not deem it necessary to express an opinion on that question at this time.

Joint Liability of Surgeons in Sponge Case—Evidence

(Spears et al. v. McKinnon (Ark.), 270 S. W. R. 524)

The Supreme Court of Arkansas says that the gist of the complaint was that after an operation for ectopic pregnancy, performed on plaintiff McKinnon at a hospital, the defendants, who were the operating surgeon and his assistant, left in the abdominal cavity a sponge or gauze which dropped into the culdesac, where it began to rot the tissue and membranes until it found its way to a point about 5 inches above the anus, where it sloughed into and out through the rectum nine months after the operation. The sufficiency of the evidence to sustain the verdict was challenged on several grounds, but, in giving the strongest probative force to the testimony of the plaintiff, all reasonable possibilities must be taken into account, and when that was done the evidence was sufficient to support the verdict in her favor.

None of the witnesses remembered having made a personal examination of the grade or size of the mesh of the gauze used in the operation, and while there was some difference between that which passed from the plaintiff and that generally used in the hospital, it might be that on the occasion of this operation the hospital had run out of the kind it generally used and procured and used the kind that passed from the plaintiff. From the circumstances in the case the jury might have so inferred. As the gauze passed out of an abscess which emitted a large quantity of pus, it could not be said, as a physical fact, that the blood stains would have remained on the gauze during its passage through rotting, sloughing tissue from the abdomen into the rectum. It was contended that the gauze would have traveled the route of least resistance, which would have been through the wall of the vagina instead of through the wall of the rectum; but, as the court interprets the testimony of the physicians, they all admitted that the route of the passage of the gauze from the abdomen to the rectum was a possible way but hardly a probable route. Before the judgment and verdict for the plaintiff could be set aside on this ground, the undisputed testimony would have to show that the route of elimination through the wall of the rectum was an impossible route.

This court cannot agree with the contention that because one of the defendants was assisting the other and was not instructed by the latter to search the abdomen for sponges after the operation, he was exempt from liability if gauzes were found in the abdomen. The record revealed that the assistant's part in the operation was to insert and withdraw the sponges. If through carelessness or negligence he failed to withdraw any of them, he could not escape liability on the ground that he was an assistant. Such a rule would have the effect of acquitting one of civil liability growing out of his own negligence.

Again, it was the contention of the defendants that no liability rested on them as physicians and surgeons on account of sponges or gauzes being left in the abdomen of the plaintiff, because the duty of counting them before and after the operation was imposed on the attendant nurse who was in the employ of the hospital where the operation was performed. In other words, that it was a rule or custom of the hospital and among physicians for the attendant nurse to ascertain by count whether any sponges or gauzes had been left in the body of the patient, which count entirely relieved operating surgeons from such responsibility, and consequently from liability growing out of a failure to remove sponges and gauze from the openings or cavities in the body. But there was no error in a refusal of the trial court to give requested instructions which expressed this idea. Nor was error committed in excluding testimony offered by the defendants tending to establish a rule or custom of the hospital or of physicians making the count by the attending nurse of sponges conclusive evidence that all of them used in the operation had been accounted for and that none of them had been left in the wound or body of the patient.

The jury found for the plaintiff the sum of $3,500 against each of the defendants. This action was against them jointly to recover damages against them as tort-feasors. There was only one operation and one damage. Both of the defendants participated in it and, according to the verdict, both were liable. Under the testimony they were liable as joint tort-feasors, if at all, and the verdict must be construed as a finding of joint and not several liability. The only way that this could be done was to construe the verdict as a joint finding against the defendants for $3,500, and the trial court should have so interpreted the verdict and rendered a joint judgment against the defendants for $3,500; and a judgment for $3,500, instead of $7,000, is here rendered against them.

Society Proceedings

COMING MEETINGS

American Pharmacological Society, Cleveland, Dec. 28-31. Dr. E. D. Brown, University of Minnesota, Minneapolis, Minn., Secretary.

American Physiological Society, Cleveland, Dec. 29-31. Dr. W. J. Meek, Science Hall, Madison, Wis., Secretary.

American Society of Biological Chemistry, Cleveland, Dec. 28-30. Dr. D. W. Wilson, University of Pennsylvania School of Medicine, Philadelphia, Secretary.

American Society for Experimental Pathology, Cleveland, Dec. 28-30. Dr. E. B. Krumbhaar, Philadelphia General Hospital, Philadelphia, Sec'y.

District of Columbia, Medical Society of, Washington, D. C., Dec. 2. Dr. C. B. Conklin, 500 Medical Science Bldg., Washington, D. C., Sec'y.

Federation of American Societies for Experimental Biology, Cleveland, Dec. 29-31. Dr. Walter J. Meek, Science Hall, Madison, Wis., Sec'y.

Philippine Islands Medical Association, Manila, Dec. 16-19. Dr. Isabelo Concepcion, College of Medicine and Surgery, Manila, Secretary.

Porto Rico, Medical Association of, Coami, Dec. 14-15. Dr. R. M. Suarez, Box 314, Santurce, Secretary.

Radiological Society of North America, Cleveland, Dec. 7-11. Dr. Robert J. May, St. Luke's Hospital, Cleveland, Secretary.

Society of American Bacteriologists, Madison, Wis., Dec. 29-31. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

Southern Medical Association, Dallas, Texas, November 9-12. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.

Southern Surgical Association, Louisville, Ky., Dec. 15-17. Dr. Hubert A. Royster, 423 LaFayette Street, Raleigh, N. C., Secretary.

Western Surgical Association, Wichita, Kan., Dec. 18-19. Dr. Harry P. Ritchie, Lowry Building, St. Paul, Minn., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL for a period of three days. No foreign journals are available prior to 1920, nor domestic prior to 1923. Periodicals published by the American Medical Association are not available for lending, but may be supplied on order. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested).

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

30: 453-602 (Oct.) 1925

*Comparison and Interpretation on Caloric Bases of Milk Mixtures Used in Infant Feeding. Grover F. Powers, New Haven, Conn.—p. 453.
*Ketosis Accompanying Infections in Children. K. H. Tallerman, London, England.—p. 476.
*Skin Temperatures in Normal Children. F. B. Talbot, A. J. Dalrymple and M. F. Hendry, Boston.—p. 483.
*Skin Temperature and Basal Metabolism During Fasting. F. B. Talbot, A. J. Dalrymple and M. F. Hendry, Boston.—p. 491.
*Blood Chemistry of New-Born in Health and in Inanition Fever. D. H. Sherman, G. W. Pucher, and H. R. Lohnes, Buffalo.—p. 496.
*Light and Antirachitic Factor. C. E. Bloch and F. Faber, Copenhagen, Denmark.—p. 504.
Chemical Composition of Spinal Fluid; Diagnostic Value. H. B. Wilcox, J. D. Lyttle and J. A. Hearn, New York.—p. 513.
*Gastric Digestion in New-Born Infants. C. Griswold and A. T. Shohl, New Haven, Conn.—p. 541.
Importance of Considering Body Mechanics of Children. L. P. Sutton, New York.—p. 550.

Caloric Bases of Milk Mixtures.—The constitution of a great number of the milk mixtures commonly used in infant feeding is expressed by Powers in terms of the percentage of each energy-producing nutrient in the total energy value of the food as fed. This method of food evaluation has been the means of extricating these heterogeneous mixtures from a maze of quantitative relationships which are metabolically meaningless, and has made them available for comparative study on a significant basis in terms of the standard unit of nutritional currency—the calory—and without regard to water content. In this simple way, a host of apparently dissimilar milk mixtures have lost an artificial individuality and have been classified in seven distinctive groups. Here individual differences may be studied where they actually exist, that is, in mineral content, chemical and biologic values of protein, carbohydrate and fat, degree of denaturization and water content. Powers says that it is a striking fact that the vast majority of successful milk mixtures used in infant feeding are unlike human milk, which stands apart from all other foods; indeed the popular mixtures are as unlike human milk as they are unlike unmodified cow's milk.

Ketosis Accompanying Infections in Children.—A study was carried out by Tallerman on a series of children presenting ketosis associated with infection. A derangement of carbohydrate metabolism, as evidenced by abnormal blood sugar curves, has been noted. In the majority of the cases, this appeared to be associated with hepatic inadequacy, as shown by the levulose tolerance test. It is probable that hepatic function is temporarily deranged as a result of the toxemia of certain infections, and ketosis results from a failure to utilize carbohydrates. Another possibility is that the abnormal blood sugar curves, especially the initial high values, are due in part to overaction of the sympathetic nervous system associated with fever. A low food intake must be mentioned as a probable contributory factor.

Skin Temperatures in Normal Children.—Skin temperature readings in five normal children were made by Talbot et al. with the thermo-electric couple, so far as possible under uniform conditions. It was found that the temperature of the skin under clothing varied, that of the trunk being higher than the extremities and exposed parts of the body. The same group of children were exposed to room temperature, and when the clothing was removed, there was an immediate fall in the skin temperature. In some instances the skin temperature continued to fall definitely during a half hour without any change in rectal temperature, while in others there was very little, if any, fall after fifteen minutes. This seems to indicate that the skin as an organ has some power of regulating the rate in which the heat is transported to it, and is able to prevent heat loss just as it is able to accelerate heat loss by perspiration.

Skin Temperatures and Basal Metabolism During Fasting.—Talbot et al. found that during fasting, the rate of heat production in the body, as measured in the child cot chamber, usually diminishes. It fell more in a fourteen day fast than in an eight day fast. The skin temperature became lower during the fast, and, in general, presented a curve similar to that of the basal metabolism; the longer the fast the greater the fall in the skin temperature of these patients. The pulse rate was usually lowered, and the blood pressure sometimes definitely lowered. This is associated with a tendency for the skin to become pale or slightly cyanotic if not well covered with clothing or blankets.

Blood Chemistry of New-Born.—Comparative data on the blood chemistry of new-born infants (twenty-three cases) on the first, third and fifth days are presented by Sherman et al. In so-called inanition fever there is a marked increase of blood urea nitrogen and amino-acids. There is marked acidosis, as shown by the marked decrease in carbon dioxid combining power. There is no decrease in the percentage water content of the blood, as measured by the total solids. These so-called inanition fevers apparently are not due to increased salt concentration of the blood.

Light as an Antirachitic Factor.—From the investigations made by Bloch and Faber and considerations thereon it appears that light and particularly ultraviolet rays have a stimulating effect on the organism, which chiefly benefits those functions that are depressed. The curative action of light on rickets and tetany can be explained by such a stimulating effect. It is certain, however, that cod liver oil has the same healing action on rickets and tetany as light has, although the former, in the quantities that can be given to children, acts more slowly and less surely than light. As this effect is not due to the vitamin A substance, there must be a stimulating factor in cod liver oil similar to that in ultraviolet light, in addition to the vitamin A substance. This proves that the nonspecific stimulating factor must be the ultraviolet rays. Evidently the hypothetic antirachitic vitamin does not exist.

Gastric Digestion in New-Born Infants.—Griswold and Shohl assert that the gastric contents of unfed new-born infants consist of gastric juice which contains free hydrochloric acid. The average p_H is 2.6. The buffer value is 9.4 c.c. The volume is 4.5 c.c. At 5 days of age, test meals removed in one hour show an average acidity of p_H 2.5, a buffer value of from 10 to 12 c.c. and a volume of 6.5 c.c. Similar values were obtained in the tenth day. The capacity for gastric digestion is greater in new-born infants than later in infancy. Gastric digestion of 50 c.c. of partly skimmed cow's milk is practically complete in one hour. It would seem logical to feed new-born infants a more concentrated and a more alkaline food.

American Journal of Hygiene, Baltimore

5: 559-708 (Sept.) 1925

*Penetration of Fruits and Vegetables by Bacteria and Other Particulate Matter, and Resistance of Bacteria, Protozoan Cysts and Helminth Ova to Common Disinfection Methods. R. G. Mills, C. L. Bartlett and J. F. Kessel, Peking, China.—p. 559.
Relation of Insect Herpetomonad and Crithidial Flagellates to Leishmaniasis. I. Inoculation of Mammals with Insect Flagellates. J. J. Drbohlav, Boston.—p. 580.
Id. II. Specificity of Various Insect Flagellates for Certain Hosts, as Indicated by Cross Infection Experiments. J. J. Drbohlav, Boston.—p. 599.
Id. III. Cultivation Requirements. J. J. Drbohlav, Boston.—p. 611.
Multiplication of Yeast in Solutions of Purified Nutrients. M. B. McDonald, Baltimore.—p. 622.
Measles in Providence, R. I., 1858-1923. C. V. Chapin, Providence, R. I.—p. 635.
*Hemolytic Proteus Bacillus. B. S. Kline, Cleveland.—p. 656.
*Proteus Hemotoxin. E. E. Ecker and H. H. Brittingham, Cleveland.—p. 662.
*Epidemic of Scarlet Fever Spread by Ice Cream. G. H. Ramsey, Lansing, Mich.—p. 669.
Pyorubrin, Red Water-Soluble Pigment Characteristic of B. Pyocyaneus. P. D. Meader, G. H. Robinson and V. Leonard, Baltimore.—p. 682.

Penetration of Fruits and Vegetables by Bacteria.—The experiments described by Mills, Bartlett and Kessel bear

directly on the question as to whether any uncooked vegetable or fruit is safe to eat, and under what conditions. It is stated that normal uninjured fruits and vegetables do not contain living bacteria within their tissues. Finely divided particulate matter, such as carbon, corresponding in size to bacteria, protozoan cysts and helminth ova, does not penetrate the stem-end of fresh vegetables to any appreciable extent. Bacteria do not penetrate the unbroken skin of fruits and vegetables kept under market conditions. Bacteria, pathogenic to man, may gain entrance to fruits and vegetables through injured and decayed portions, where they may spread to a very limited extent, and may remain alive for from seven to forty-two days. They may also contaminate the cut-end of vegetables and remain viable for a similar length of time. It is, therefore, advisable to remove such portions before attempting sterilization. Pathogenic bacteria may persist on the surface of fruits and vegetables kept under moist conditions for fifteen days or more. The gradual loss of moisture through the covering of fruits and vegetables would tend to keep them viable longer than would be possible on perfectly dry surfaces. When such foodstuffs are freshened with water, the viability would be influenced by the saprophytic flora, normal to such an environment. Chlorination freed the surface of vegetable matter from pathogenic bacteria in every instance, but was not effective against cysts or ova. Dipping fruits and vegetables for ten seconds into boiling water or water which remains above 80 C. during the immersion, is the only method thus far discovered which will uniformly kill all pathogenic bacteria, protozoan cysts and helminth eggs which might be found contaminating such food products, and render them safe for human consumption in an uncooked condition.

Hemolytic Proteus Bacillus in Bone Marrow in Pernicious Anemia.—A marrow smear was made by Kline at necropsy of a case of severe anemia having all the clinical manifestations of pernicious anemia, forty-six hours post mortem, and found to contain, in addition to the usual cytologic picture, a large number of proteus bacilli. A culture was obtained after charring one end of a rib in the free flame by expressing through this end a small amount of marrow. A few loopfuls of this material were shaken up in 2 c.c. of broth and the suspension streaked on Endo and blood agar plates. The next day hundreds of colonies were noted, apparently a pure culture of proteus bacillus. This organism grows well on ordinary mediums, has a fairly characteristic sugar reaction and unusually great hemolytic power. The blood picture was followed in eighteen inoculated animals, smears showing the appearance in the circulation of a moderate number of nucleated red blood cells, usually within forty-eight hours. Megaloblasts, also in moderate number, were occasionally observed. Animals, inoculated with repeated, increasing doses of the organism, over a period of a few weeks, developed a siderosis, more marked in the spleen and bone marrow, moderate in the liver. A hyperplastic bone marrow was found in the majority of the inoculated animals.

Proteus Culture.—The hemotoxin of a culture of *Proteus*, isolated from human bone marrow, was studied by Ecker and Brittingham. The toxin rapidly hemolyzed human, sheep, dog, cat, guinea-pig and rat erythrocytes. The production of *Proteus* hemotoxin varied greatly with the strain employed. The lytic principle was independent of the life of the organism. The organisms were killed by etherization. The cultures remained toxic after cell death. The lytic principle was retained in the filtrate of cultures passed through a Berkefeld candle. The hemotoxin was thermolabile. Even as low a temperature as 37 C. weakened it. At 45 C. its power was greatly reduced and at 55 C. it was completely destroyed. Ultraviolet light greatly retarded its power, depending on distance and length of exposure. Normal rabbit serums, if given sufficient time to act on the toxin, prior to the addition of the cells, will protect. Antihemotoxic (rabbit) serums, however, demonstrated a definite neutralizing power, if the serum and toxin were first mixed and the cells then added to them. Under similar conditions normal rabbit serums failed to protect. These antihemotoxic serums did not protect against the action of tetanolysin.

Scarlet Fever Spread by Ice Cream.—An epidemic of scarlet fever occurred in Flint, Mich., during July and August, 1924. A rapidly developing epidemic in hot weather, when scarlet fever is out of season, immediately suggested dissemination through some food product. The results of detailed investigations confirmed these suspicions, and definitely fixed the responsibility for the epidemic on an ice cream maker who continued working while he was clinically a scarlet fever patient. He made all of the ice cream sold by his company over the week end of July 26, a pleasant, warm Saturday and Sunday, which invited ice cream consumption. Of the 116 patients, sixty-two, or 53.45 per cent., were attacked within three days of this Sunday, and an additional thirty-six, or 31.03 per cent., during the following week. Milk supplies were found to have no relation to the outbreak.

American Journal of Medical Sciences, Philadelphia

170: 313-468 (Sept.) 1925

*Adiposity and Other Etiologic Factors in Diabetes Mellitus. J. M. Anders and H. L. Jameson, Philadelphia.—p. 313.

*Problems in Diagnosis and Treatment of Infiltrating Tumors of Cerebral Hemispheres: New Surgical Procedure. C. A. Elsberg, New York. —p. 324.

*Leptospirosis Icterohemorrhagica (Weil's Disease). J. Sailer, Philadelphia.—p. 332.

*Tintometer for Analysis of Color of Skin. L. G. Rowntree and G. E. Brown, Rochester, Minn.—p. 341.

*Giardiasis. B. B. V. Lyong and W. A. Swalm, Philadelphia.—p. 348.

*Tropical Sprue in Child Six Years of Age. With Isolation of Monilia from Patient and Tissues of Inoculated Animal. G. Johnson and F. T. Breidigain, Battle Creek, Mich.—p. 364.

*Severe Anemias of Pregnancy and Puerperium. R. C. Larrabee, Boston. —p. 371.

*Nonfatal Carbon Monoxid Poisoning: Report of a Case. B. J. Alpers, Phialdelphia.—p. 390.

*Effect of Spleen Extract and Bone Marrow on Blood Picture in Pulmonary Tuberculosis. R. W. Dunham, Oak Forest, Ill.—p. 394.

*Six Cases of Pyelitis in Newly Born Infant. R. H. Graham, Aurora, Ill.—p. 401.

*Practical Value of Neutral Red as Test for Gastric Secretory Function. G. M. Piersol, H. L. Bockus and J. Bank, Philadelphia.—p. 405.

*Unusual Eosinophilia with Splenomegaly (Eosinophilic Leukemia?) in Child Aged Six Years. M. H. Bass, New York.—p. 416.

Increased Permeability of Vessel Walls as Frequent Cause of Pulmonary Hemorrhage. F. M. Pottenger, Monrovia, Calif.—p. 420.

Nonpostcicatricial Keloid: Case. G. L. Waldbott, Detroit.—p. 425.

Subphrenic Abscess. L. Tuft, Philadelphia.—p. 431.

Adiposity as Cause of Diabetes Mellitus.—The predominant effect of adiposity as a predisposing cause of diabetes is indicated by the figures quoted by Anders and Jameson. They believe that the phenomenal rise in the diabetes death rate and incidence among women in recent years is not due solely to their greater and more general adiposity.

Operation for Cerebral Tumors.—Elsberg suggests that instead of the major operative procedure used in these cases the following method be adopted as a regular procedure: An incision is made through the scalp under local anesthesia, in a location and direction that it may form part of the line of incision for the outlining of an osteoplastic flap, if that be later required. Through this primary short incision, a button of bone is removed with the trephine and a small incision, sufficient to permit the passage of a blunt brain puncture needle, is made in the dura. If no tumor is found directly under the opening in the dura, the subdural space is carefully explored in various directions with a broad, flat probe made of German silver and bent so that it can be passed underneath the dura. For this purpose, the blunt cannula devised for puncture of the corpus callosum can be used. If a distinct, firm resistance is felt by this subdural exploration—as would occur in the presence of a meningeal tumor—then the surgeon at once proceeds to anesthetize a large area to divide the scalp and to make a large osteoplastic bone flap. If no resistance is met with, the brain itself is punctured in several directions with a blunt ventricular puncture needle. If a cavity which contains the typical yellow fluid which occurs in a gliomatous cyst is entered, the fluid is emptied by aspiration, air is injected in order to obtain a roentgenogram of the cyst cavity, and the small incision in the scalp is then closed by suture and the patient sent to the roentgen-ray room. If, on the other hand, no resistance to the passage of the blunt needle is encountered (and this is often the case), the small plugs of brain tissue obtained by aspiration are carefully

preserved in liquor formaldehydi for histologic examination. The direction in which the needle was passed and the depth to which it was inserted is carefully noted, and the operation is concluded for the time being. The further course of the procedure will depend on the results of the roentgen-ray and the laboratory examinations.

Infectious Jaundice in Philadelphia.—Two cases of infectious jaundice are reported by Sailer in each of which *Leptospira icterohemorrhagica* was found. It is believed that they are the first cases occurring spontaneously to be recognized in Philadelphia and its environs.

Tintometer for Analysis of Skin Color.—From a large number of plaques representing artists' reproductions of skin color from approximately 100 normal and pathologic subjects a tintometer has been constructed by Rowntree and Brown which apparently covers adequately the entire range of color variations encountered in human skin in health and disease. The tintometer consists of multiple color scales, each composed of ten plaques, representing progressive increase in color, each plaque of which has been analyzed qualitatively and quantitatively and expressed in three dimensions of hue, value and chroma. The normal range of variations has been first determined. A separate color scale has been constructed for jaundice, cyanosis, erythrosis and brown pigmentations, each resembling somewhat the Tallqvist scale employed in the clinical determination of hemoglobin. By means of these tintometers direct comparisons with the color of the skin are made.

Giardiasis.—Lyon and Swalm report and analyze the clinical data in twenty cases of giardiasis in adult patients. The disease is most often found clinically associated with disease of the gallbladder, bile ducts and duodenum. It is unusually resistant to all forms of treatment.

Tropical Sprue in Child.—A case of tropical sprue in a child, aged 6 years, including animal inoculation and isolation of *Monilia psilosis* both from the animal after necropsy had been done and from photomicrographs of the parasites as stained in tissue, is reported by Johnson and Breidigain together with the treatment given and the results.

Anemias of Pregnancy and Puerperium.—Seventeen cases are recorded by Larrabee of anemia occurring in pregnancy and the puerperium, all of severe grade. The blood picture may be that of secondary anemia, pernicious anemia, or aplastic anemia, or it may be atypical. All seven patients with the secondary blood picture recovered. Transfusion seems a question of expediency rather than necessity. Eight patients presented the pernicious blood picture. Of four not transfused, three died. Four recovered after transfusion. One patient with aplastic anemia died in spite of transfusion. In a highly typical case recovery ensued after splenectomy, repeated transfusions having been unsuccessful.

Nonfatal Carbon Monoxid Poisoning.—Alpers reports a case of proved carbon monoxid poisoning in which exposure was not sufficient to cause death, but in which the symptoms corresponded to the anatomic distribution of the lesions found in more severe cases. By means of this also a closer correlation of clinical and pathologic findings is possible, for a careful study of the former in a patient not succumbing to the gas will reveal where and to what extent certain brain areas are affected in the less severe cases, and whether these cases show a progressive degeneration in the areas affected. Aside from this, the progress of a patient who has been sufficiently injured by carbon monoxid to produce definite symptoms of brain destruction without causing death is in itself a matter of interest, particularly since very few such cases have been put on record.

Spleen Extract and Bone Marrow in Tuberculosis.—Twenty-three cases of active pulmonary tuberculosis are reported by Dunham in which this medication was employed; two showed no improvement in the blood picture; three were slightly improved; seven moderately improved and eleven were markedly improved, making a total of twenty-one cases, or 91 per cent. improved. Spleen extract and bone marrow will definitely increase the production of erythrocytes and hemoglobin.

Infecting Organism in Pyelitis of New-Born.—The infecting organisms in Graham's series were *Staphylococcus aureus*, a nonhemolytic streptococcus and *B. coli*, each in two cases. The time of onset suggests an invasion by the bacteria at the time of birth in most instances. One case suggests a congenital infection. Leukocyte counts ranged from 11,000 to 16,000. Blood cultures were negative. These patients responded to alkalis and large quantities of water.

Neutral Red Test of Gastric Function.—Piersol, Bockus and Bank assert that neutral red can be looked on only as an imperfect test for gastric function, since it furnishes no information as to the motor power of the stomach.

Eosinophilia with Splenomegaly.—A case of extreme eosinophilia is described by Bass occurring in a girl, aged 6 years. During the two and a half months in which the child was under observation she showed a moderately enlarged spleen; slight general adenopathy; leukocytosis varying between 14,800 and 25,600; eosinophilic polymorphonuclear cells varying between 37 and 64 per cent., and eosinophilic myelocytes present up to 6.3 per cent. Four somewhat similar cases in adults are reported from the literature, two with necropsy. The relation of this condition to leukemia is discussed.

American Journal of Ophthalmology, Chicago

8: 681-752 (Sept.) 1925

Operation for Glaucoma. J. Stefansson, Winnipeg, Can.—p. 681.
Coloboma of Iris, Choroid and Optic Disc with Detachment of Retina. H. P. Wagner and F. Gipner, Rochester, Minn.—p. 694.
Extensive Sarcoma Originating from Pigmented Nevus of Conjunctiva. F. Lane, Chicago.—p. 698.
Hysteric Amblyopia and Amaurosis. F. E. Burch, St. Paul.—p. 699.
Medullated Nerve Fibers Involving Macula. G. F. Libby, Denver.—p. 713.
Ocular Effects of Lipin-Protein and Defatted Tubercle Bacilli Injected into Common Carotid Artery of Rabbits. D. H. O'Rourke, Denver.—p. 715.
Uveitis. A. C. Woods, Baltimore.—p. 721.

8: 761-848 (Oct.) 1925

Circulatory Regimen of Glaucoma. A. Magitot and P. Bailliart, Paris, France.—p. 761.
Mustard Gas Burn of Cornea. D. J. Lyle, Cincinnati.—p. 779.
Tumor of Orbit, of Doubtful Origin. R. E. Wright, Madras, India.—p. 781.
Hydrophthalmus. H. D. Lamb, St. Louis.—p. 784.
Melanosarcoma of Choroid. F. E. Brawley, Chicago.—p. 790.
Critical Survey of Neoplasms of Choroid. M. S. Knight, Rochester, Minn.—p. 791.
Conical Cornea. V. Westcott, Chicago.—p. 802.
Our Knowledge of Focal Infections. G. Woodruff, Joliet, Ill.—p. 805.
Bilateral Congenital Microphthalmus with Cyst of Orbit. V. Derkac, Zagreb, Jugoslavia.—p. 809.
Voluntary Nystagmus. D. B. Kirby, New York.—p. 810.
Neuropapilledema in Chlorosis. G. N. Brazeau, Milwaukee.—p. 811.
Buphthalmus. J. A. Morgan, Honolulu, T. H.—p. 813.
Scissors Magnet Extraction. E. Jackson, Denver.—p. 813.

Archives of Dermatology and Syphilology, Chicago

12: 463-612 (Oct.) 1925

Late or Tertiary Manifestations of Yaws. P. D. Gutierrez, Manila, P. I.—p. 463.
*Recklinghausen's Disease. H. Schneiderman, Kansas City Mo.—p. 483.
Granuloma Pyogenicum; Twenty-Nine Cases. H. E. Michelson, Minneapolis.—p. 492.
Angioma Cavernosum. Case Treated with Radium. C. N. Frazier, Peking, China.—p. 506.
*Epitome of History of Syphilis. A. Capper, Philadelphia.—p. 509.
Leukonychia. M. S. Woolf, San Francisco.—p. 520.
Telangiectasia; Treatment with Cautery. S. Feldman, New York.—p. 522.
*Sodium Chlorid in Treatment of Bromism. James Stevenson, Boston.—p. 525.
Hair; Hypertrichosis. C. H. Danforth, Stanford University, Calif.—p. 528.

Recklinghausen's Disease.—The study of four cases by Schneiderman failed to reveal any endocrine dysfunction in the etiology of Recklinghausen's disease. He supports, however, the theory of an embryonic disturbance in the ectoderm as the cause of neurofibromatosis. Furthermore, Recklinghausen's disease has a distinct hereditary tendency in the great majority of cases, if not in all. Many patients with this anomaly deny the presence of cutaneous tumors in other members of the family because some other member happens to have the so-called abortive type of Recklinghausen's dis-

ease, having only one or two small tumors, and a predominance of nervous symptoms. These patients are not only unrecognized by the family, but by the physician as well. In the light of experimental revelations, it is more probable that the anomalies represented by Recklinghausen's disease are due to a physical, chemical or nutritional disturbance in the environment of the developing embryo at the stage when the ectoderm is forming the nervous system and are transmitted to the following generations according to the mendelian law.

History of Syphilis.—Capper is convinced that syphilis did not exist in the Old World before 1493, except, perhaps, in Eastern Asia, and particularly along the Pacific coast. Syphilis did exist in America before Columbus arrived there. The origin of syphilis in America could perhaps be traced by way of the Bering sea from Japan or from any other part of Eastern Asia. Syphilis was imported into Europe from the New World by the crew of Columbus in 1493. The epidemic that was raging in Europe following the return of Columbus was due either to some disease or diseases other than syphilis or to syphilis plus the other diseases, syphilis, however, playing a minor rôle in the ravages resulting from the epidemic.

Sodium Chlorid in Treatment of Bromism.—Stevenson states that sodium chlorid given in appreciable amounts intravenously or by mouth hastens the excretion of bromid from the body. This action is not due to dieresis, but to the chlorid replacing bromid by mass action. If given by mouth, sodium chlorid may well be administered in phenol salicylate coated tablets or pills, 60 grains once a day. The bromodermas rapidly regress under this treatment. Nephritis is a contraindication to this therapy.

Georgia Medical Association Journal, Atlanta

14: 357-398 (Sept.) 1925

Myxedema. H. R. Slack, LaGrange.—p. 359.
Gastric and Duodenal Ulcers with Medical Treatment. J. D. Gray, Augusta.—p. 362.
Roentgen Ray in Diagnosis of Duodenal Ulcer. L. P. Holmes, Augusta.—p. 368.
Ulcers of Stomach and Duodenum. R. H. Chaney, Augusta.—p. 370.
Acute Appendicitis; Peritonitis (General); Ileo-Appendiceal Fistula. B. T. Beasley, Atlanta.—p. 375.
Breath Sounds Over Mastoid Cells. J. R. Lewis, Louisville.—p. 375.

Journal of Urology, Baltimore

14: 199-310 (Sept.) 1925

*Typhoid Infections of Kidney. F. S. Patch, Montreal.—p. 199.
*End-Results in Renal Infections. W. C. Quinby, Boston.—p. 223.
Need of Conservatism in Renal Surgery. A. L. Chute, Boston.—p. 231.
Cases of Two-Step Nephrectomies. N. G. Alcock, Iowa City.—p. 239.
Rôle of Nephrostomy in Genito-Urinary Surgery. A. H. Crosbie, Boston.—p. 239.
*Blood Transfusions in Genito-Urinary Surgery. M. L. Boyd, Atlanta, Ga.—p. 253.
*Operative Approach for Malignant Tumors of Kidney. H. Cabot, Ann Arbor, Mich.—p. 261.
Solitary Serous Cyst of Kidney; Case. R. F. O'Neil, Boston.—p. 269.
*Bladder Neoplasms. D. W. MacKenzie, Montreal.—p. 275.
Total Cystectomy for Cancer; An Obsolete Operation. E. Fischel, St. Louis.—p. 285.
Fallacious Orifice; Contracture of Vesical Neck. J. R. Caulk, St. Louis.—p. 293.
Sarcoma of Prostate; Case. H. Culver, Chicago.—p. 301.
Improved Knife for Young's Prostatic Punch. H. A. R. Kreutzmann, San Francisco.—p. 311.

Typhoid Infections of Kidney.—Two cases of pyonephrosis due to *B. typhosus* are reported by Patch, and eight cases from the literature are reviewed. In both of Patch's cases, the disease was unilateral. There is nothing to indicate the exact time of onset in either case. In the first case, there was no history of an attack of typhoid. The woman may have been a typhoid carrier, in the gallbladder or in the intestine. Infection in the kidney may at any time have been precipitated by any localizing incident in the kidney. In the second case, there was nothing in the case history to indicate when the renal infection began. It may have been contracted in either one of two attacks of typhoid in 1911 and 1920. Masses of calculi were found scattered in the calices of the first case. Patch believes that typhoid infections of the kidney are more common than has been generally believed. They must be regarded as of hematogenous origin.

End-Results in Renal Infections.—Quinby states that a kidney is capable of withstanding a very considerable amount of infection without loss of all its factor of safety in renal tissue. The course of infections of the kidney is usually of long duration, symptoms of a general sort being often slight and to be found only on careful investigation, intermingled by exacerbations of greater or less severity, which attacks are not rarely erroneously attributed to "grip," "lumbago" or "biliousness." Localizing symptoms, either of kidney or of bladder, are frequently absent, especially in the earlier months of the infection and between the acute attacks. The possibility of restoring a kidney to a state of healthy activity and of preventing continuance of renal damage should be better appreciated by both the family physician and the surgeon. In many an instance there is abundant opportunity for a much earlier diagnosis than is usually made. Institution of treatment at a time preceding that at which the kidney has become badly crippled in its structure and overwhelmed by infection will avoid many nephrectomies. For this purpose the method of frequent renal lavage through the inlying ureteral catheter, which at the same time relieves stasis, is of great benefit.

Blood Transfusion in Genito-Urinary Surgery.—Boyd's experience with transfusions of blood lead him to advocate very strongly their use in genito-urinary surgery. Not only are they of value for the purpose of saving life in an extreme emergency, but also to assist in carrying patients safely through operations by giving them needed blood before operation, and to mitigate the symptoms due to a loss of blood and shock.

Incision for Tumor of Kidney.—The transverse incision combined with a vertical midline incision is regarded by Cabot as the method of election for attack on tumor of the kidney. The incision should be started well back in the loin near the anterior border of the erector group. It should be planned to pass not far from the lower border of the twelfth rib, inclining slightly downward until it reaches the midline of the body in the region of the umbilicus. The course of this incision does not traverse any nerve trunks of importance and will not result in paralysis of the rectus or of any important amount of the oblique muscles. It is then met by an incision in the midline carried upward to any necessary extent. This can do no damage to nerve supply or to any other important structure. It allows the raising of a triangular flap which gives direct access to all of the structures of the upper quadrant. Through this incision the costal margin may be lifted as freely as is ordinarily necessary. The peritoneum is lifted from the posterior wall, carrying with it the colon and its mesentery, which may be turned inward as far as the midline. This flap of peritoneum with its intestinal and mesenteric content has the effect of keeping the other intestines out of the way and gives a wholly satisfactory view of the field.

Bladder Neoplasms.—MacKenzie analyzes 228 cases, of which 118 were malignant. There were thirty-nine papillomas, seventy papillary carcinomas, eight carcinomas and one sarcoma. Hematuria was the chief complaint in 75 per cent. of cases and usually the cause for seeking relief. Frequency was the chief complaint in 25 per cent. of cases, and was an associated complaint in from 40 to 60 per cent. Dysuria was the chief complaint in 10 per cent. of cases; and an associated symptom in from 15 to 20 per cent.

Philippine Journal of Science, Manila

27: 455-610 (Aug.) 1925

*Disturbances of Cutaneous Sensibility in Leprosy. J. N. Rodriguez.—p. 455.
Hookworm Campaign in Cebu. C. Manalang.—p. 483.
Horse Parasites Collected in Philippine Islands. B. Schwartz and E. B. Cram.—p. 495.
Two Strange New Fishes from Luzon. A. W. C. T. Herre.—p. 507.
Anthicidae of Philippines. H. Krekich-Strassoldo.—p. 515.
Tenebrionides (Coleptera) of Indomalay. VII. Von H. Gebien.—p. 539.

Cutaneous Lesions in Leprosy.—Rodriguez asserts that not all the cutaneous lesions of leprosy are anesthetic. Sixteen per cent. of infiltrations do not show any disturbance of the cutaneous senses. The character of the anesthesia depends

on whether it is located in a macule, an infiltration, or a skin free from lesions. In macules there is, as a rule, early loss of epicritic sensibility; in nodules and infiltrations the anesthesia is very variable; and in a skin free from eruptions a partial dissociation of the syringomyelic type is effected. These differences suggest the possibility that the cutaneous nerves may be involved in various ways, depending on the character of the overlying skin lesion. The anesthesia shows definite improvement under ethyl ester treatment although, as is to be expected, it is not as well marked as the improvement in the cutaneous lesions. Although the absence of anesthesia does not exclude leprosy, the touchstone in doubtful cases, from the clinical standpoint, is its presence in some cutaneous lesion or in some skin area. The final confirmation of the diagnosis is the presence of the specific organism in the lesions or on the nasal septum.

Tennessee State Medical Association Journal, Nashville

18: 89-120 (Aug.) 1925

Complete Bilateral Duplication of Ureters; Case Report. P. Bromberg, Nashville.—p. 89.
Glaucoma. W. S. Dotson, Lebanon.—p. 99.
Operative Treatment of Spastic Cerebral Paralysis. J. S. Speed, Memphis.—p. 107.
Hand Infections. L. M. Woodson, Gallatin.—p. 112.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

9: 433-480 (Sept.) 1925

Acute Retrobulbar Neuritis Affecting Optic Chiasm and Tract. H. M. Traquair.—p. 433.
Two Cases of Nontraumatic Cysts of Anterior Chamber. D. J. Wood.—p. 450.
Cyst of Iris. R. E. Wright.—p. 454.

British Journal of Radiology, London

30: 283-326 (Sept.) 1925

*Some Rarer Intracranial Calcifications and Ossifications. J. O'Sullivan.—p. 295.
Radium Treatment of Tumors of Skin. A. Burrows.—p. 304.

Intracranial Calcifications.—O'Sullivan cites cases of (1) symmetrical retrobregmatic ossifications of the dura; (2) calcified cysticercus; (3) calculi in the brain, and (4) a calcified tumor, probably a psammoma in the posterior portion of the left lateral ventricle.

British Medical Journal, London

2: 547-588 (Sept. 26) 1925

Borocaines: New Class of Local Anaesthetics. A. J. Copeland and H. E. F. Notton.—p. 547.
Syphilitic Nephritis. G. B. Dowling.—p. 551.
*Treatment of Diabetes by Raw Fresh Gland (Pancreas). R. Carrasco-Formiguera.—p. 552.
Present Position of Pathology and Bacteriology in England. J. C. G. Ledingham.—p. 554.
Food Manipulation in Relation to Health. W. G. Savage.—p. 560.
II. Accidental Contamination of Food. C. E. Goddard.—p. 563.
*Death Following Passing of Stomach Tube. G. A. Allan.—p. 565.
Full-Time Pregnancy in Bicornuate Uterus. J. C. Lyth.—p. 565.
Optic Neuritis Due to Disease of Anterior Ethmoidal Cells. H. Nuttall.—p. 565.
*Recurrent Hair-Ball of Stomach. R. Harris.—p. 565.
*Splenic Anemia: Splenectomy; Recovery. G. R. Kingston.—p. 566.
Transient Glycosuria Following Scorpion Sting. G. Graham.—p. 566.
*Death from Hemorrhage in Scarlet Fever. A. Calder.—p. 566.
Acute Appendicitis Associated with Sarcoma of Appendix and Volvulus of Cecum. V. Pennell.—p. 566.

Fresh Pancreas in Treatment of Diabetes.—The data obtained by Carrasco-Formiguera in one case studied carefully show that, in a patient who had never before received insulin and was on a constant diet, raw fresh pancreas, administered in the form advised by Hollins, and even with an additional dose at dinner time, thoroughly failed to diminish a glycosuria (it was rather increased), which was very quickly reduced to traces on the next day by a very moderate dose of insulin, and completely disappeared on the fifth day of insulin treatment. All duly controlled experiments, recent as well as ancient, show that the oral administration of raw fresh pancreas has no beneficial immediate effect on glycosuria in diabetic patients. Thus far, there are no known facts supporting the very faint theoretic possibility that this form of pancrotherapy might have any kind of delayed beneficial influence in the treatment of diabetes.

Death Follows Passing of Stomach Tube.—Allan relates the case of a man who complained of pains in the epigastrium and behind the shoulder coming on soon after the taking of food and accompanied by flatulence, in addition to much shortness of breath on exertion. Every effort to find a cause for this condition proved futile. Finally, a further test meal was given to determine whether there was any alteration in the gastric acidity. When the tube was passed to remove the stomach contents, the patient had an attack of coughing and a dram or two of fluid was ejected from the tube. He suddenly became very pallid and the tube was immediately withdrawn, but he died almost instantaneously. There was no external bleeding. The only explanation that could be offered was that the patient had had an attack of syncope or angina set up reflexly by the passing of the tube. Necropsy was not permitted.

Recurrent Hair Ball of Stomach.—Harris relates the case of a woman from whose stomach five hair balls had been removed on five separate occasions, in 1911, 1920, 1922, 1923 and 1924. Apart from her hair-eating habits, this woman was quite normal mentally. She seems to have suffered no permanent ill effects from her repeated operations.

Splenic Anemia with Splenectomy.—Kingston's patient, aged 5½ years, had had twenty-two attacks of melena, and six of hematemesis, nearly all being severe enough to blanch the child and keep her almost constantly in bed. She was tapped eleven times at weekly intervals, from 4 to 7 pints of clear straw-colored fluid being removed on each occasion. The spleen was removed. It weighed 1 pound. Five months after the operation the child was much stronger, had gained 14 pounds in weight and was much improved in general health.

Death from Hemorrhage in Scarlet Fever.—The hemorrhage in Calder's case occurred on the thirty-fourth day of the disease, from the external jugular, which ruptured and the child died. Incident to a very severe sore throat a great deal of sloughing resulted exposing the vein and the carotid artery to view.

China Medical Association Journal, Shanghai

39: 667-766 (Aug.) 1925

Development and Longevity of Hookworm Larvae in Different Temperature Conditions. R. Stevensson.—p. 667.
Hookworm Control in China. N. Bercovitz.—p. 673.
*Fundus Oculi of Kala-Azar Patients. W. P. Ling.—p. 681.
Syphilis: Central Nervous System and Antisyphilitic Treatment. M. O. Pfister.—p. 688.
Eight Years' Work in China in Gynecologic Outpatient Clinic. F. J Heath.—p. 701.
*Hongkong Foot. G. N. Frazier.—p. 705.
*Operation for Superficial Varicose Veins of Leg. R. B. Price.—p. 712.
Preputial Calculus. E. C. Wilford.—p. 712.

Fundus Oculi in Kala-Azar.—Observations made by Ling on the fundus of five cases of kala-azar suggest a definite relationship between the occurrence of retinal hemorrhages and the low degree of secondary anemia in this disease. Of four patients with retinal hemorrhages two were observed long enough to show complete absorption. In one case complete absorption took fully four months. In a second case it took about five months. The gradual absorption of hemorrhage goes hand in hand with the improvement of the anemia.

Hongkong Foot.—Hongkong foot is an infectious disease of mycotic origin found in North, Central and South China. In Peking, during the summer months, it is commonly seen and occurs with equal frequency among Chinese and foreigners. The initial symptom is a persistent, intolerable itching of the hollow of the sole, or of the toes and the interdigital spaces. This symptom does not disappear with the development of cutaneous lesions. These manifest themselves in one of two forms, or more frequently in a combination of the two. The first and more common consists of small, deep-seated, epidermal vesicles, which contain a clear serum. These are usually situated on the inner margin of the hollow of the

sole; on or between the toes, especially the third, fourth and fifth digits at their proximal extremities; and on the plantar surface near the toes. The great and second toes are conspiculously avoided by the infection. With evolution of the vesicular lesions their coverings become thinner and usually rupture, discharging a sticky, serous fluid, after which rapid desiccation and exfoliation ensues. New lesions continue to form throughout the active period of the disease. With the onset of cold weather the process has a tendency to subside. Not uncommonly through traumatism and lack of care, secondary pyogenic infection complicates the picture. The vesicular type is found on the hands, concomitant with or independent of, similar lesions of the feet. Hongkong foot is not peculiar to China. Under the name of eczematoid dermatitis of the extremities, ringworm of the hands and feet, Dhobie itch of the toes, epidermophytosis, etc., the disease has been described in Europe and America (where it is quite common) and in tropical countries.

Operation for Superficial Varicose Veins.—The operation employed by Price is as follows: the patient is anesthetized and the leg allowed to hang over the table, thereby distending the veins, or a tourniquet may be applied. The surgeon with heavy silk threaded in a curved skin needle, passes a number of sutures through the skin, under the vein, and out through the skin at a point on the opposite side of the vein from the point of entrance. These sutures are placed from one-fourth to one-half inch apart and as many may be used as desired. The ends of the sutures are caught with forceps and when all are in place they are tied tightly, usually from above downward, in bowknots on top of the skin. Occasionally, the needle punctures a vein but this accident makes no difference, for other sutures on each side of the puncture will close the vein. After all sutures are tied the leg is wrapped loosely in a sterile cloth, secured with safety pins. A bandage will cause great pain. The patient is kept in bed. On the seventh day after operation the sutures will be found to have become loose. They are untied and tied again tightly. This is somewhat painful but not excessively so. On the fourteenth day the sutures are removed and the patient is allowed out of bed. The vein will have been obliterated.

Indian Medical Gazette, Calcutta

60: 403-452 (Sept.) 1925

Diagnosis of Hookworm Infection; Estimating Egg Output. A. C. Chandler.—p. 403.
*Toxicity of Carbon Tetrachlorid to Cats. A. C. Chandler.—p. 406.
"Diagnosis" in Hospitals. C. C. Murison.—p. 407.
Dementia Praecox. F. Noronha.—p. 415.
*Experiments in Air Embolism. A. R. D'Abreu.—p. 417.
Abdominal Conditions with Inflation of Oxygen Gas. R. S. Grewal.—p. 421.
*Action of Disinfectants on Microbes. H. Grosh.—p. 423.
"Stibosan" (Von Heyden "471"). S. K. Das.—p. 425.
*Internal Strangulation by Spermatic Cord. M. N. S. Chetti.—p. 426.
Gangrene of Testes After Torsion of Spermatic Cord. M. N. S. Chetti.—p. 426.
Pedunculated Papilloma of Tongue. H. J. H. Spreadbury.—p. 427.
Swallowed Corkscrew. H. M. Hande.—p. 427.
Case of Undetected Gunshot Wound. P. Pant.—p. 427.
Malignant Pustule. G. Panja.—p. 428.

Toxicity of Carbon Tetrachlorid.—Of forty-nine cats which were given 0.5 c.c. of carbon tetrachlorid per kilogram, only four survived; of twenty-seven which were given 0.25 c.c. per kilogram, three survived; and of twelve given 4 c.c. per kilogram, all died. Ten of the twelve which were given 4 c.c. vomited within about half an hour. Altogether, eight cats out of the eighty-seven died on the day following treatment, thirty on the second day, twenty-three on the third day, seven on the fouth day, and four on the fifth day; five were killed when in a dying condition, and seven survived. Chandler and Chopra cut sections of the liver and kidney of all these cats, and sections of the spleen, suprarenal, and intestinal wall of many of them. No significant changes were found in the spleen, and in only a few instances was found the necrosis reported by Phelps and Hu. The intestinal wall in some instances showed the villi severely congested and occasionally denuded of the epithelium. The really important lesions were found in the liver and kidneys. The liver in every instance showed the central necrosis which is so characteristic of carbon tetrachlorid, and usually a very extensive fatty degeneration was present. From 25 to almost 100 per cent. of the liver tissue was damaged, even in cats which received only 0.25 c.c. per kilogram. Most remarkable, however, were the lesions found in the kidneys; in many, if not in most, instances, Chandler and Chopra believe that the renal rather than the hepatic damage was the actual cause of death and that the susceptibility of this organ in cats accounts for the much greater toxicity of carbon tetrachlorid for cats than for dogs. The convoluted tubules showed extensive fatty degeneration and frequent necrosis, but the collecting tubules were as a rule little affected; there was often desquamation—sometimes very extensive—of Henle's loops. The Bowman capsules were frequently infiltrated with blood, and the glomerular endothelium was swollen and the vessels dilated. In every instance in which it was possible to obtain urine at necropsy there was albumin present, often in great quantity, and there was frequent evidence of blood.

Air Embolism.—A few small bubbles of air injected into a vein at a slow rate are apparently harmless, and the same also appears to apply to a small continuous column of air, judging from the results of D'Abreu's experiments. In one experiment, 24 ounces of air was sufficient to produce the death of a bull weighing approximately 500 pounds, so that a man weighing from 140 to 154 pounds would proportionately take about 6 or 7 ounces as the lethal dose.

Action of Disinfectants on Microbes.—The interesting point in the experiment made by Grosh is that the microbes seem to be killed by a certain dilution of the disinfectant up to the first five hours of contact but divide and multiply when placed in fresh medium after twenty-four hours. It is possible that most of the microbes are killed by the disinfectant effect of the chemicals used; others, more resistant, get attenuated and lose the power of division and multiplication for a certain period, during which time they show no growth even when placed in a fresh medium. This period may be called a period of shock to the bacteria. Later, as the time of contact increases, this condition of shock passes off, and they adapt themselves to the environment and begin to multiply again, and on inoculation into new medium show abundant growth.

Internal Strangulation by Spermatic Cord.—In Chetti's case, the abdomen was distended like a drum and tender all over. The pulse rate was 90 per minute, the respiration 30 and the temperature was normal. The patient, on examination, had just commenced to vomit. Although nothing pointed to any trouble in the scrotum, this was examined. The skin of the scrotum was loose. The testis with its sac was felt to be tense, but no tenderness was elicited. There was no evidence of bulging of the inguinal canal or enlargement of the external ring. The usual signs of an ordinary inguinal strangulated hernia were absent. There was absolutely no pain over the ring. An incision was made over the external ring both above and below. A small sac was exposed and incised, and a small quantity of brownish-red fluid was emptied out. The testicular substance was a dark purple and was found to be tightly gripped at the external ring above the globus major. An attempt was made to pull the testis downward without success. The external ring was gently and gradually incised; when it was sufficiently cut, the testis went into the abdomen with a snap. There was nothing else in the sac or in the inguinal canal. An attempt was made to search for the lost testis inside the abdomen through the internal ring, but it failed. The usual operation for hernia was performed and the patient was put back to bed. Chetti emphasizes the importance of careful examination of the scrotum in all cases of acute intestinal obstruction.

Archives des Maladies du Cœur, etc., Paris

18: 497-560 (Aug.) 1925

*Intermittent Claudication of Syphilitic Origin. Letulle et al.—p. 497.
*The Oculocardiac Reflex. Fribourg-Blanc and Hyvert.—p. 512.
*Mitral Stenosis with Angina Pectoris Symptoms. L. Telia.—p. 531.

Intermittent Claudication in an Old Syphilitic.—Letulle and his co-workers observed a case of intermittent claudication in a man, aged 72, with syphilis of over fifty years' standing.

Necropsy showed that the lameness which had started two years before, was due to arteritis obliterans affecting the abdominal aorta, both iliac arteries and particularly the tibial arteries. While in diabetes the inflammatory lesions are localized in the tunica intima, in this case the middle and outer coats were chiefly involved. Infiltration of the arterial walls with cholesterol was less manifest than in diabetes.

Electrocardiograph Record of the Oculocardiac Reflex.—Fribourg-Blanc and Hyvert's research was made on 174 patients with nervous or mental disease. Compression of the eyeballs not only changed the heart rhythm, but also increased the oscillometric index in 97 per cent. of the cases. The rise in this index did not parallel the retarding or acceleration of the pulse. Increase of the systolic tension as well as reduction of the diastolic tension seemed to be connected with the rise of the oscillometric index. Electrocardiographic curves taken during the compression of the eyeball indicated an increased amplitude of intra-ocular tension in persons without functional disturbances of the myocardium. This corresponded to an exaggerated excitability of the myocardium with stronger contractions of the ventricle. Rise of the oscillometric index revealed peripheral vasoconstriction of sympathicotonic origin. Oscillometric curves, preceding and following the compression of the eyeball, demonstrate the condition of the arterial circulation in the subject.

Syndrome of Angina Pectoris with Mitral Stenosis.—Telia reports three cases which explain the mechanical origin of the pain in cases of mitral stenosis. His patients were between 17 and 27. Necropsy findings in one case showed that the attacks were traceable to the left coronary artery compressed between the left auricle and the pulmonary artery. The special precordial pain with mitral stenosis—the aortalgia—is explained by compression of the aorta and aortic plexus by the enlarged left auricle. Bloodletting (from 300 to 500 gm.) is suggested to relieve the attacks.

Bulletins de la Société Médicale des Hôpitaux, Paris

49: 1217-1298 (July 31) 1925

*Vaccination of New-Born Animals Against Diphtheria. C. Zoeller.—p. 1218.
Insulin in Treatment of Marasmus. Lesné and Dreyfus-Sée.—p. 1219.
Nephritis with Acidosis. F. Rathery et al.—p. 1223.
Cancer of the Lung. G. Caussade et al.—p. 1232.
Fatal Mercuric Chlorid Poisoning. L. Babonneix and L. Pollet.—p. 1241.
Lung Cancer with Perforation into Heart. Caussade et al.—p. 1243.
Fatal Meningitis Caused by Friedländer's Bacillus. Le Grand.—p. 1250.
*Cholesterol of the Bile in Cholelithiasis. M. Chiray et al.—p. 1252.
Capillaroscopy in Arteritis Obliterans. A. C. Guillaume.—p. 1272.
Tuberculoma of Pons Varolii. L. Babonneix and J. Hutinel.—p. 1275.
Melanuria without Melanoma. I. Goin.—p. 1277.
Cantering Rhythm with Four Sounds. Laubry and Routier.—p. 1281.
Nonsurgical Drainage of Biliary Tract by Means of Drugs. F. Ramond et al.—p. 1284.
Etiology and Anatomy of Duodenitis. Ramond and Darquier.—p. 1285.
Meltzer-Lyon Test for Study of Cholagogues. F. Ramond et al.—p. 1289.

Vaccination of Very Young Subjects Against Diphtheria.—Zoeller states that the results of his experimental vaccination against diphtheria, made during several recent months, seemed to confirm the clinical findings. Two injections of 0.5 c.c. of anatoxin, with a fifteen days' interval, were given to two new-born guinea-pigs, and 1 c.c. to three older guinea-pigs. All these animals were given a lethal dose of diphtheria toxin three months afterward. None of them died. A characteristic local reaction was manifest in the younger, but was absent in the older guinea-pigs, thus proving the greater resistance to antidiphtheria vaccination in the very young.

Cholesterol in the Bile in Gallstone Cases.—Chiray and his co-workers' conclusions are based on thirty-seven observations. In healthy subjects the amount of soluble cholesterol in the bile was not modified in visceral diseases, without changes of the liver, and not even in affections of the gallbladder, except cholelithiasis. The usual decrease of soluble cholesterol in the bile was not always present with gallstones. The fact may be explained by the two phases of the disease, the stage of formation of the gallstones, and the stage of mechanical and infectious complications. The alternation of these stages induces formation of concentric deposits on the gallstones, each layer corresponding to a lithogenetic stage. It is possible that the colloidal instability of the cholesterol is due to an insufficient secretion of biliary salts, and that the cholelithiasis is due rather to a disturbed liver secretion than to a primary affection of the biliary tract.

Comptes Rendus de la Société de Biologie, Paris

93: 553-756 (Aug. 14) 1925. Partial Index

*Action of Graafian Follicle Extract. Brouha and Simonnet.—p. 557.
Physiology of Neutrophils. A. Alexeieff.—p. 558.
*Clinical Importance of Cytodiagnosis. A. Alexeieff.—p. 561.
Acid-Base Balance of Cerebrospinal Fluid. Cestan et al.—p. 563.
*Fate of Trypanosomes in Galleria Body. E. Ivanoff.—p. 571.
*Immunization of Galleria to Danysz' Bacterium. J. Chigasaki.—p. 573.
*Morphology of Tonsil Capsule. R. Argaud and A. Viéla.—p. 574.
*Immunization Against Tetanus. G. Ramon and A. Laffaille.—p. 582.
Fat Transformation Cycle in the Organism. Grigaut and Dejace.—p. 586.
*Vagus in Peptone Shock. Garrelon and Santenoise.—p. 598.
*Albuminuria from White of Egg. M. Garnier and E. Schulmann.—p. 600.
*Antiscurvy Property of Preserved Orange Juice. Vagliano.—p. 602.
*Affinity of Radium for Cancer. Ferroux and Lacassagne.—p. 604.
*Organotherapy of Cachexia. P. Carnot and E. Terris.—p. 606.
*Action of Radium on Tetanus Toxin. R. Ferroux and S. Mutermilch.—p. 608.
Anatoxin Immunization Against Shiga's Bacillus. P. Lesbre.—p. 612.
"Individual Reactivity." C. Zoeller.—p. 615.
The *pH* of Pancreatic Juice. Dubois and Polonovski.—p. 632.
*Bacteriophage in the New-Born. R. Pierret and V. Bilouet.—p. 635.
*Apparatus for Pasteurization. Marmier.—p. 637.
*Rapid Test for Urea. C. and S. Auguste.—p. 641.
Immunization of Bacteria Against Bacteriophage. I. N. Asheshov.—p. 644.
Action of Insulin on Beriberi. X. Chabovitch.—p. 652.
Ducrey's Bacillus Not Hemoglobinophil. W. Lipinski.—p. 657.
*Golgi's Apparatus and Mitochondria. J. Hirschler.—p. 663.
*Typhus Virus in Birds. E. Selivanoff.—p. 664.
*Atropin and Atrioventricular Conductibility. P. Meyer.—p. 668.
The Acidosis with Chronic Nephritis. L. Blum et al.—p. 698.
Acid-Base Balance in Uremia. L. Blum et al.—p. 701.
*Permeability of Red Blood Corpuscles. L. Blum et al.—p. 704.
*Influence of Carbon Dioxid on Eggs. T. Rogalski.—p. 706.
Aeration of Pasteurized Milk. Stassano and Rollet.—p. 716.
Arterial Tension After Injury of the Artery. A. Cosacesco and I. Banu.—p. 732.
Surgical Treatment of Angina Pectoris. Daniélopolu and Marcu.—p. 737.
Vegetative Tonus in Psychoses. A. Obregia et al.—p. 744.
*The Suprarenals in Epilepsy. Popea and Eustatziu.—p. 747.
*Cholesteremia in Epilepsy. A. Popea and A. Vicol.—p. 749.
*Action of Protein Shock on Tonus. A. Obregia et al.—p. 751.
*Influence of Calcium on Vegetative System. Popescu-Inotesti.—p. 752.

Injection of Graafian Follicle Liquid.—Brouha and Simonnet observed that an injection of an extract of the follicle fluid prolonged the estrual cycle in mature rats, but did not modify the periodicity. The extract had no apparent influence on gestation. No changes were manifest in the mammary gland. The castrated female rats seemed to be more responsive to the follicle extract than the immature females.

Cytodiagnosis in Colitis and Pyorrhea.—Classification of the cells in pus from the stools showed that ulcerative and other forms of colitis belong to the group of chronic bacillary dysentery. The cell findings in twelve cases of alveolar pyorrhea were identical with those from normal gums. This seems to indicate that pyorrhea is not an infectious disease, but is caused by invasion of the alveolar cavity, after separation of the gum, by bacteria usually present in the mouth. Alexeieff adds that pyorrhea—for the etiology of which 350 different theories have been advanced—seems to be merely an exaggerated physiologic leukocytorrhea.

Sensitiveness of Galleria to Trypanosomes.—Injection of trypanosomes did not affect the transformation cycle of *Galleria mellonella* larvae. The fecundated insects continued to lay their eggs after the injection. Mice died in two to four days after hypodermic injections of trypanosomes that had passed through the galleria.

Immunization of Galleria.—Chigasaki's experiments demonstrated that *Galleria mellonella* is easily immunized against Danysz' bacterium in each of its three metamorphosis stages. The acquired immunity of the caterpillar is transmitted to the chrysalis and the moth.

Formation and Rôle of Tonsil Capsule.—Argaud and Viéla's research on the embryo, the new-born, adults and elderly persons showed that the capsule of the tonsil develops from the pharyngeal epithelium. It not only protects the organ, but exerts a mechanical action on the expulsion of secretions.

Immunization Against Tetanus.—Ramon and Lafaille easily induced an active immunity against tetanus in guinea-pigs and rabbits by one or two injections of anatoxin, at a twenty day interval. The same results were obtained with an injection of anatoxin given after simultaneous injections of tetanus antiserum and anatoxin. Injection of tetanus anatoxin-antitoxin mixture did not confer immunity; it seemed to hamper the immunizing action of the anatoxin, injected afterward.

Rôle of Vagus in Sensitization to Protein Shock.—Garrelon and Santenoise's further experiments on ninety dogs confirmed their conclusion that sensitization to protein shock depends on the vagus and its action on the thyroid gland.

Albuminuria from Injection of White of Egg.—Garnier and Schulmann induced albuminuria in rabbits by injections of the white of egg. The renal lesions were analogous to those from injection of different poisons. The toxic element of the white of egg did not vary under heating as long as the temperature was below that of albumin coagulation.

Antiscorbutic Property of Preserved Orange Juice.—Vagliano fed one series of guinea-pigs on a scurvy ration and another on the same diet to which a syrup made from orange juice had been added. The syrup was prepared six months before with four parts of orange juice, two of sugar and one of water, heated to 120 C. for half an hour. While all the animals of the first series died from scurvy within twenty-five days, the other group remained perfectly healthy. Obviously neither the prolonged heating nor the age had affected the antiscorbutic property of the orange juice. The conservation of vitamin C may have been due to the action of the sugar, which also insures the conservation of the antiscorbutic property of condensed milk.

Radium Emanation has No Affinity for Cancer Tissue.—Ferroux and Lacassagne's experiments on five rats with implanted cancer indicated that radium emanation, injected by any route, is chiefly found in the eliminating organs. There was no evidence of any affinity of the emanation for cancer tissue.

Gain of Weight Under Organ Extracts from Fattened Animals.—The treatment was applied by Carnot and Terris in two cachectic women, aged 69 and 52, weighing, respectively, about 62 and 67 pounds. Aside from visceroptosis there were no grave lesions. Extract of liver from a fattened pig was injected in an oil vehicle. Twenty-six injections of the solution, corresponding to 0.18 gm. of a dry extract, induced in the older woman a gain of weight by about 8 pounds in thirty-six days. In the younger woman, still under treatment, ten similar injections were followed by a gain of 2 pounds in sixteen days.

Action of Radium Emanation on Tetanus Toxin.—Ferroux and Mutermilch's tests in mice revealed that the toxicity is completely destroyed in tetanus toxin by exposure to radium emanation. Further experiments demonstrated that the antigen property is destroyed simultaneously with the toxicity under the emanation. This contrasts with the well known fact that physical and chemical agents destroy the toxic elements of toxins first. Toxins thus transformed to toxoids or anatoxin retain their antigen property, and can therefore be utilized in experimental vaccination.

Absence of Bacteriophage in the New-Born.—Pierret and Bilouet examined the meconium of eight new-born infants up to 4 days old. No bacteriophage for Shiga's, colon or typhoid bacilli could be detected even in meconium rich in microorganisms. The bacteriophage content was excessive in the stool of an infant, aged 12 days. The fact may be explained by absence of bacterial growth in the first few days of life.

Improved Pasteurizing Apparatus.—Marmier describes a pasteurizer in which sterilization is performed automatically. No supervision of the apparatus is required.

Bedside Test for Urea in Blood.—The Augustes say that only one drop of the whole blood is needed. After xanthydrol precipitation by the usual technic, the reading is made the third minute. The test is accurate enough for ordinary purposes. The fluid is limpid or more or less turbid.

Common Feature of Golgi's Apparatus, the Cell Nucleus and the Mitochondria.—Hirschler emphasizes that these three are each enclosed in a membrane which is capable of reduction of osmic acid.

Fate of Typhus Virus in Bird Body.—Selivanoff inoculated lice, guinea-pigs and rabbits with brain from birds infected with typhus virus. The findings proved that the vitality and toxicity of the virus diminished during its sojourn in the bird's body. The serum from the infected birds did not contain antibodies.

Action of Atropin on Heart Block.—Meyer's research was on men and dogs injected intravenously with atropin. The dromotropic action of atropin on atrioventricular conductivity, during the stimulation phase, is due to its sympathicotropic action; it exerts besides a direct effect on His' bundle. In two cases with block of His' bundle, no improvement of the atrioventricular conduction was obtained with 1 mg. of epinephrin, while a marked influence was manifest with small doses of atropin. These findings suggest, he says, a more rational treatment of heart block.

Permeability of the Erythrocytes.—Blum and his co-workers found that under the action of carbon dioxid, acids penetrate into the erythrocytes, while bases pass from the erythrocytes into the plasma.

Action of Carbon Dioxid on Development of Hen's Eggs.—Rogalski noted that carbon dioxid injures hen's eggs and interferes with their development. The lesions are the more pronounced the longer the eggs remain in contact, and the higher the temperature of the eggs. The lesions are similar to those from roentgen rays or aging.

The Suprarenals in Epilepsy.—The necropsy findings in two cases of epilepsy showed reduction or absence of lipoid in the cortex of the suprarenal capsules. Popea and Eustatziu assume that the lipoid is utilized for neutralization of toxins produced by the excessive muscular contractions in the epileptic seizures. This would confirm anew the antitoxic action of the suprarenals.

Cholesterolemia in Epileptic Seizures.—Popea and Vicol observed during seizures a diminished cholesterol content of the blood in each of sixteen epileptics. The cholesterol may have been used up during the excessive functioning of the nervous and muscular systems or in destroying the toxins from the exaggerated muscular contractions. Since the seizures were frequent in these cases, the cholesterolemia persisted low in the intervals.

Protein Shock May Restore Vegetative Tonus to Normal.—Obregia and his co-workers induced protein shock, by milk injections, in forty insane patients. The vegetative tonus became normal when it had been previously augmented or diminished. It did not vary if it had been normal before. He queries whether to ascribe this fact to the functional activity of the cell protoplasm and the colloid balance of the body fluids or to assume that the improvement in the vegetative tonus had restored the colloid balance of cells and humors.

Action of Calcium Ion on Vegetative System in Man.—With small doses of calcium (from 0.1 to 1 gm.) injected intravenously, Popescu-Inotesti induced phenomena of sympathetic excitation, namely, tachycardia, hypertension, mydriasis, hyperglycemia or sometimes tachypnea. Injection of large doses (from 1.5 to 4 gm.) caused excitation of the parasympathetic, with bradycardia, miosis, bradypnea. The hypertension in this instance is due to a direct stimulation of the muscle fiber of the vascular wall.

Presse Médicale, Paris

33: 1281-1296 (Sept. 26) 1925

*Influence of Nervous System on Action of Poisons. H. Roger.—p. 1281.
*Artery of Keith and Flack's Node. E. Géraudel.—p. 1283.
*Catarrhal Jaundice. Marcou-Mutzner.—p. 1286.
*Diet for Peptic Ulcer. A. Jarotzky.—p. 1288.
Faure's Technic for the Mikulicz Drain. A. Madrid.—p. 1289.
The Dawn of War Surgery in Antiquity. P. Jeunhomme.—p. 1291.

Influence of Nervous System on Action of Toxic Substances.—Roger injected strychnin in frogs in stupor from the electric shock induced by a Leyden jar. Spasmodic muscular con-

tractions did not appear until thirty-four minutes, and tetanic spasms only after one hour while in the controls this occurred in five and fourteen minutes. When an injection of veratrin was given after the sciatic nerve had been severed, the action of the poison on the gastrocnemius muscle on that side appeared later and was less pronounced than in the muscle of the other side. When the normal muscle has ceased to respond to even very strong excitation, the denervated muscle continued to contract for a few hours. Analogous phenomena were manifest after section of one half of the spinal cord; the muscles of the paralyzed side resisted the action of the poison longer. Obviously, the nervous system exerts a considerable attenuating influence on the action of toxic substances. This may be due to reduction of the sensibility of the muscle to the poison, or to the impeding of the passage of the latter from the blood into the tissues, entailed by the exclusion of the nerve.

Anatomic and Clinical Aspects of the Artery of the Sino-Auricular Node.—Géraudel gives an illustrated description of this artery, emphasizing the connection between functional changes in Keith and Flack's node and a disturbed blood supply. He believes that the artery of the sino-auricular node is a terminal artery, without anastomoses, analogous to arteries in the brain.

Catarrhal Jaundice Not An Infectious Disease.—The onset of the catarrhal jaundice in Marcou-Mutzner's seven cases resembled a colloidoclastic shock. The sudden appearance of fever, joint pains, urticaria, vomiting and asthenia coincided with an intense bile output in the stools. This was followed by bile pigments in the urine. He asserts that the phenomena can be ascribed neither to angiocholitis nor to retention of bile in the biliary ducts. An exaggerated insufficiency of assimilation of protein substances, under various intoxications, induces overproduction of bile in the liver as a defence reaction. Acute swelling of the liver, which occurred in these patients within a few hours, was evidently due to hypertrophy of the overworking hepatic cells. The treatment should aim to arrest the resorption of products of proteolysis; carbohydrates, lactic ferments, curdled milk or yoghurt may influence the intestinal fermentations. Vitamin deficiency should be avoided. Sodium sulphate in small doses in Vichy water seemed to have a favorable action in his experience.

Diet Treatment of Ulcer of the Stomach and Duodenum.—Jarotzky insists that milk should be suppressed in the cases of gastric hypersecretion. White of egg and unsalted butter, given separately, form his special diet for treatment of peptic ulcer. A raw white of egg, not whipped, is given without salt, alternating with fresh unsalted butter. During the eight or ten days of the course the use of water is prohibited. The patient keeps in bed for the time of the treatment. One white of egg in the morning and a tablespoonful (29 gm.) of butter in the afternoon are given the first day. The ration is daily increased by one white of egg and 20 gm. of butter, till ten whites and 180 gm. of butter are given per day. No other food or drug is allowed. The diet appeared more efficient than fasting after gastric hemorrhage. Relief of pain, subsiding of gastric contractions, allowing better chances for healing of the peptic ulcer, followed this diet treatment. Various cereals, vegetables and fruits, cooked in water without salt and passed through a sieve, are given after the eighth or tenth day. This treatment has been successfully applied in several Russian hospitals since 1910, and he says that it has been used in the United States, citing Altshuler and others.

Archivio Italiano di Chirurgia, Bologna

11: 549-923 (July) 1925

*Research on Gastric Secretion. A. Ciminata.—p. 549.
*Recurring Tubal Pregnancy. E. Momigliano.—p. 792.

The Gastric Secretion.—Ciminata devotes 242 pages to his review of previous research on the secretory function of the stomach and his own experiments on dogs, thirteen with a Pawlow stomach pouch. There seems to be a direct connection, he says, between the water content of the food and the amount of gastric juice secreted. The secretion is most profuse with milk and meat, and it occurs earlier. Water alone stimulates secretion, but only for a short time. The acidity seems to depend on the rapidity of the secretion and not on the kind of food, but the peptic potency seems to be determined by the nature of the food—highest with bread, less with meat, and least with milk. The food always contains substances which stimulate secretion, but these substances are locked up in the food. They are released only by the gastric juice, so that gastric digestion requires that the secretion be already under way when the food reaches the stomach. This is usually provided by the psychic gastric secretion, aided further by water, which starts a brief secretion. These two factors release the secretion-inducing substances, and these continue with greater intensity the task of stimulating production of gastric juice. Without "appetite secretion" and without water, food, such as bread, which is not digested so readily as meat and milk, may lie even in the healthy stomach for hours without a trace of digestion. The more intense the psychic gastric secretion, the earlier and more completely the food will be digested. The acidity of the gastric contents depends on the degree of neutralization by mucus, and this in turn depends on the speed of the secretion. With bread, for instance, which has only a comparatively weak and slow secretogenous action, there is time for much mucus to form and thus neutralize the acid. The more rapid the digestion, the sooner the stomach evacuates its contents. There can be no gastric juice, he adds, when chlorin is lacking. The splitting of hydrochloric acid and hydrates seems to occur specifically in the secreting cells.

Recurring Tubal Pregnancy.—Momigliano analyzes sixteen cases of recurring tubal pregnancy operated on at the Rome clinic. One of the cases seemed to be a bilateral tubal pregnancy but the operation demonstrated tubal abortion of an older date on one side, probably several months before. In most cases, the first tubal abortion had caused no appreciable symptoms, or so vague as not to be recognized. In the 314 cases of extra-uterine pregnancy at the clinic since 1913, inflammatory processes or gynecologic operations had preceded it in 65.3 per cent. In 1.9 per cent. there was hypoplasia of the genital organs. No cause for the anomaly could be discovered in 32.4 per cent.

Revista de la Soc. de Med. Interna, Buenos Aires

6: 241-274 (July) 1925

*Posttraumatic Heart Block. R. A. Bullrich and A. Lacroze.—p. 241.
Preliminary Hemoclastic Crisis in Paroxysmal Hemoglobinuria. N. Romano and J. J. Beretervide.—p. 248.
The Protein Reactions of Insulin. G. Peco.—p. 259.
*Sign of Toxic Nature of Rheumatism. S. Libarona Brian.—p. 264.

Posttraumatic Heart Block.—A physician consulted on account of an attack of influenza had found the pulse of the man, aged 43, practically normal. A year later, after a fall from a horse, injuring the left side of the chest, he was unconscious for a day and a half, and there was much coughing, pain and blood stained expectoration for a time, with persisting dyspnea on exertion. Three months after the accident, symptoms of auricular fibrillation and heart block developed, and this condition has persisted for the four months to date.

Differential Diagnosis of Rheumatism.—Libarona Brian states that an infectious rheumatism can be distinguished from a chronic rheumatism of toxic origin by the absence of the exacerbation which the latter usually presents with a change to damp and cold weather and the improvement in dry and warm weather or environment. The rheumatic disturbances in gout are the only exception to the reliability of this barometric differential sign of toxic as distinguished from toxinic rheumatism. In toxic rheumatism the patients are always inclined to be chilly. He has treated a number of patients of the toxic rheumatism type with systematic alkaline injections, and he claims excellent results.

Salvador Médico, San Salvador

4: 709-755 (June) 1925

Radiology in Medical Practice. Rafael Vega Gómez, Jr.—p. 714.
Pathogenesis of Angina Pectoris. E. Fasquelle.—p. 722. C'td.
Sarcoma in Broad Ligament of Girl of 8. V. M. Northleau.—p. 734.
*A Nervous Form of Malaria. M. Alvarez V.—p. 738.

Cure of Pyloric Ulcer by Gastro-Enterostomy. E. A. Saldaña.—p. 741.
Cyst in the Pancreas. Recovery. E. G. Prieto.—p. 744.
Code of Medical Ethics. Supplement. C'tn.

A Nervous Form of Malaria.—Alvarez relates that a man, aged 55, was brought to the hospital in a comatose condition. He had presented chills and fever for the preceding three weeks, of the tertian type. Then he suddenly lost the power of speaking and of moving his arms and legs. The paresis was accompanied by pronounced exaggeration of the tendon reflexes. There was also trismus, with incontinence of anus and bladder, and dilated pupils. A lumbar puncture was negative, but the blood showed *Plasmodium malariae*. The symptoms began to improve at once after the second injection of quinin. He left the hospital in a month apparently completely cured, but there was retrograde amnesia.

Semana Médica, Buenos Aires

2: 469-536 (Aug. 27) 1925

Penal Aspect of Deforming Injury of the Face. Nerio Rojas.—p. 469.
Twenty-Fifth Anniversary of the Circulo Médico. G. Aráoz Alfaro.—p. 475.
Pathogenesis of Diabetes Insipidus. G. Bosco.—p. 477.
Influence of Various Factors on Action of Insulin. Houssay.—p. 480.
Chronic Arsenic Poisoning from Drinking Water. Fernández.—p. 485.
*Growth Exostoses and Mammary Tumor. Vallino and Macera.—p. 489.
Perirenal Abscess. J. Salleras.—p. 492.
Remote Results of Suture of Ulnar and Median Nerves. Caeiro.—p. 495.
Osteomyelitis of Flat Bones of Skull. Y. Franchini.—p. 497.
Dental Caries in the School Age. A. Casotto.—p. 501.
Test for Perborate in Presence of Borate. L. Rossi.—p. 502.
Present Status of Vaccination Against Tuberculosis. Arena.—p. 503.

Multiple Exostoses and Mammary Tumor.—The mother and one brother presented similar exostoses to those observed on a girl, aged 13, whose left breast was amputated on account of a fibro-adenoma.

Archiv für Gynäkologie, Berlin

126: 1-290 (Sept. 9) 1925

Cartilage in Fundus of Uterus. H. O. Neumann.—p. 1.
Giant Cells in Uterine Cancer. W. Schiller.—p. 11.
*Ovarian Function, Blood Ions and Vegetative System. Schultze.—p. 35.
*Water Metabolism in Pregnancy. H. Runge and R. Kessler.—p. 45.
Sequels of Cesarean Section. E. Klaften and L. Bodnar.—p. 65.
*Site of Placenta and Shape of the Uterus. R. Demme.—p. 92.
*Action of Thyroglobulin in Pregnancy. A. Mahnert.—p. 125.
*Blood Volume in Pregnancy. P. Bohnen and K. Borrmann.—p. 144.
*Painless Labor in Hypnosis. U. Franke.—p. 160.
*Changes in the Circulation from the Menopause and Castration. E. Strassmann.—p. 169.
Vaccine Treatment of Ascending Gonorrhea in Women. P. Schumacher and H. Kliewe.—p. 233.
Sperma and Artificial Fecundation. M. Mettenleiter.—p. 251.

Ovarian Function, Blood Ions and Vegetative System.—Schultze confirms that there are certain relations between the ovarian function and the potassium and calcium content of the serum. This suggests some influence of the corpus luteum on the sympathetic. Without this influence, especially in the amenorrhea of young girls, a predominance of the vagus may appear, with a shifting of the ratio between the ions. The potassium content of the blood serum was in some of these patients as low as 14 mg. per hundred cubic centimeters. An increase of the calcium concentration is less common. He assumes with Dresel that the lowering of the potassium level in the blood serum is associated with an increased concentration of the ion in the tissues.

Water Metabolism in Pregnancy.—Runge and Kessler measured the osmotic (oncotic) pressure of the plasma colloids in pregnancy and the puerperium, using the Schade and Claussen method. The results were compared with the refraction and viscosity of the plasma. The osmotic pressure of the plasma colloids rises in the beginning of pregnancy. It gradually becomes lower after the fourth month, rises suddenly during labor, and falls in the first days after delivery. The changes of the protein concentration of the plasma are only to a certain extent parallel; the specific viscosity varies partly in the opposite sense.

Site of Placenta, Shape of the Uterus, and their Mechanical Import.—Demme describes a characteristic flattening of one side and a convex outline of the other side of the uterus, which are visible through the abdominal wall. If the back of the fetus is situated in the convex part, a coiling of the umbilical cord may be expected. He describes the mechanism of this complication, and reports his investigations on the site of the placenta.

Action of Thyroglobulin in Pregnancy.—Mahnert injected intravenously from 0.03 to 0.05 gm. of iodin-thyroglobulin in pregnant women. Those with edema responded usually with diuresis and marked increase in the elimination of uric acid, urea and chlorids. The blood cholesterol became lower.

Blood Volume in Pregnancy.—Bohnen and Borrmann used Grieshach's congo red method. The blood volume in normal controls averaged 6.4 per cent. of the body weight. In the first half of pregnancy, 7.7 per cent.; in the second half, 7 per cent. The decrease in the second part is chiefly due to the increase in weight.

Painless Labor in Hypnosis.—Franke describes the technic for obstetric hypnosis. Several preliminary hypnoses are necessary before amnesia is obtained. He recommends a combination of hypnosis in labor with administration of 3 c.c. of chloroform. The good or bad example of the other pregnant women influences the results. He obtained in 80 per cent. of the cases a complete success, with absolute amnesia.

Cardiovascular Changes from the Menopause and Castration.—Strassmann found an average increase of 20 mm. of mercury in the blood pressure of women in the menopause or with myomas of the uterus. In 15-20 per cent. of the former group and in 40 per cent. of the latter, it leads to an enlargement of the heart. Frequent hemorrhages lower the blood pressure. Enucleation of the myomas did not influence it. Surgical castration is followed at first by a lowering of the blood pressure—depending on the gravity of the operation. Later on, the pressure rises (average 32 mm. systolic and 15 mm. diastolic) in women who had been previously menstruating. It has no permanent influence in the menopause. Roentgen amenorrhea after an ovarian dose produces no hypertension—probably because the internal secretion of the ovaries continues. Only the deep irradiation in malignant tumors raises the blood pressure and causes enlargement of the heart.

Deutsche medizinische Wochenschrift, Berlin

51: 1599-1640 (Sept. 25) 1925

*The Nervous System and Metabolism. A. Oswald.—p. 1599.
Hematuria. H. Kümmell.—p. 1600. C'td.
*Cause and Treatment of Peptic Ulcer. M. Katzenstein.—p. 1603.
*Hunger Sensation and Gastric Acid. O. Müller.—p. 1607.
Fractional Examination of Gastric Contents. K. Hoesch.—p. 1608.
Physiology of the Upper Duodenum. K. Kaestle.—p. 1610.
*Cholagogues and the Duodenal Tube. Taschenberg and Hofmann.—p. 1611.
*The Blood Sugar in Rabbits. M. Lévai and O. Waldbauer.—p. 1612.
*Pathogenesis of Dysoxidative Carbonuria. J. A. Collazo.—p. 1614.
*Influencing of Diuresis by Hypnosis. R. Heilig and H. Hoff.—p. 1615.
Alimentary Azoturia as Kidney Function Test. H. Steinitz.—p. 1616.
*Action of Certain Drugs on Evacuation of the Stomach. Petrović.—p. 1619.
Portable Apparatus for Urine Examination. Welckenbach.—p. 1620.
*Calcium Treatment of Dysentery. Teodosijevits.—p. 1620.
Immune Diagnosis of Tuberculosis. F. Klopstock.—p. 1621.
Morbidity Statistics in the United States. F. Prinzing.—p. 1624.
Changes in Accident Insurance. Martineck.—p. 1625. C'td.
The Wurtemberg Medical Association. Bok.—p. 1627.
The Climatology Congress at Davos. Von den Velden.—p. 1628.
Habitual Constipation. G. Lepehne.—p. 1638. C'td.

The Nervous System and Metabolism.—Oswald finds that only the patients whose nervous system is disturbed react with hyperthyroidism to administration of iodin or thyroid extracts.

Cause and Treatment of Peptic Ulcer.—Katzenstein reviews the clinical and experimental evidence supporting the theory of a disturbed balance between pepsin and antipepsin. He explains some contradictory findings by pointing out that only a very active gastric secretion can digest living tissue. A loop of intestine sewed into the stomach of dogs is not digested if the activity of the secretion is kept low by a practically meat free diet or by atropin. He advises to give ulcer patients internally a preparation of antipepsin in alkaline solution. A blood transfusion is the best remedy in hematemesis. He says that it acts as a hemostatic, and contributes to the healing of the ulcer by increasing the anti-

pepsin content of the blood. Although a surgeon, he recommends to try medical treatment first, even in indurated ulcers. The best surgical treatment is the Billroth I resection.

Hunger Sensation and Gastric Acid.—Müller found in the majority of patients with a sensation of hunger or hunger pains, a low gastric acidity.

Cholagogues and the Duodenal Tube.—Taschenberg and Hofmann tested the action of various cholagogues (phenylcinchoninic acid derivatives, magnesium sulphate, oil of peppermint and sodium glycocholate), using the duodenal tube. They confirm the action of the remedies, but emphasize the fact that neurotic subjects are wholly unsuitable for these experiments. The secretion is soon arrested in such cases.

The Blood Sugar in Rabbits.—Lévai and Waldbauer found great spontaneous changes in the blood sugar concentration in rabbits. The difference in samples taken on different days from the same fasting animal amounted to 64 per cent. Hence the inconstancy of insulin units determined on rabbits.

Pathogenesis of Dysoxidative Carbonuria.—Collazo found an increased amount of lactic acid in the blood from avitaminotic pigeons and dogs. The urine of these dogs contained lactic acid. This was especially pronounced after exertion. He concludes that lactic acid is one of the components of dysoxidative carbonuria.

Influencing of Diuresis by Hypnosis.—Heilig and Hoff made the diuresis experiment in hypnosis, suggesting pleasant and unpleasant sensations. The former decreased the elimination of water, chlorids and phosphates; the latter increased it. They explain this as secondary to the changes of gastric secretion (hyperchlorhydria with pleasant and hypochlorhydria with unpleasant suggestions).

Action of Atropin and Epinephrin on the Evacuation of the Stomach.—Petrović found more stomach contents after ingestion of 600 c.c. of water and an injection of atropin than with the water alone or combined with an injection of epinephrin.

Calcium Treatment of Dysentery.—Teodosijevits reports excellent results of calcium chlorid in dysentery. He injected 10 c.c. of a 10 per cent. solution twice daily, and added morphin subcutaneously.

Klinische Wochenschrift, Berlin

4: 1849-1896 (Sept. 24) 1925

Lipoids and Metabolism of Cells. M. Rubner.—p. 1849.
*Frequency of Cancer of Lungs. R. Staehelin.—p. 1853.
*Hexose-Phosphoric Acid of the Blood. H. Lawaczeck.—p. 1858.
Roentgen-Ray Diagnosis of Respiratory Organs. Landau.—p. 1861.
*Inhibition of Exudation by Pituitary Extract. Saxl and Donath.—p. 1866.
*Fermentation Acids and Digestive Disturbances in Infants. Catel.—p. 1867.
*Lactic Acid Elimination in Carcinosis. K. Glaessner.—p. 1868.
*Hematology of Rats with Rickets. E. Maurer et al.—p. 1869.
*The Blood in Hypertension. E. Kylin and G. Myhrman.—p. 1870.
*Action of Myrtillin on Depancreatized Dogs. H. Eppinger et al.—p. 1870.
*Herpes Zoster and Chickenpox. E. Lauda and E. Silberstern.—p. 1871.
*Syphilis and Tuberculosis. E. Liek.—p. 1872.
Strontium Treatment. K. Grassheim.—p. 1873.
Distress of the Profession and Academic Medicine. W. Heubner.—p. 1876. Reply. F. Reichert.—p. 1880.
Injection of Peptone in Hemoptysis. E. Schönberger.—p. 1895.

Frequency of Cancer of Lungs.—Staehelin confirms the increased frequency of primary cancer of the lungs since 1912, in Basel, while the general incidence of cancer has not changed. He suggests that tarring of the streets may be one of the possible causes.

Hexose-Phosphoric Acid of the Blood.—Lawaczeck found about 1 mg. of hexose-phosphoric acid per hundred cubic centimeters of blood. Injection of epinephrin causes a lowering of the acid followed by an increase. Insulin increases its concentration, yet a decrease follows. He regards the second phase as the reaction of the organism: secondary insulinemia in the first and epinephrinemia in the second instance. One group of diabetic patients react like normal subjects; the other group in the opposite way. This latter group also shows a paradoxic influence of injections of epinephrin and insulin on the blood sugar. He believes that it represents only a functional diabetes due to a pathologic equilibrium between insulin and epinephrin—not necessarily to insufficiency of the pancreas.

Experimental Inhibition of Exudation by Pituitary Extracts.—Saxl and Donath found that an injection of pituitary extract or of neo-arsphenamin inhibited the exudation due to instillation of mustard oil in the conjunctiva of rabbits. They explain this by the action of these substances on the reticuloendothelial system.

Fermentation Acids and Digestive Disturbances in Infants.—Catel found that enterococci produce in vitro much more lactic acid than volatile fatty acids. Colon bacilli act the reverse. Lactic acid and its sodium salt do not irritate the bowel, while the other acids cause a strong peristalsis, especially in the small intestine.

Lactic Acid Elimination in Carcinosis.—Glaessner injected mice intravenously with glucose, using about 1 per cent. of their body weight. Mice inoculated with carcinoma responded with an elimination of lactic acid by the urine. The acid was absent in the urine from healthy and sarcomatous controls.

Hematology of Rats with Rickets.—Maurer, Diez and Berendt found constantly myelocytes and normoblasts in rats with experimental rickets.

Potassium and Calcium of the Blood in Hypertension.—Kylin and Myhrman found a slight increase in the potassium content of the serum in 100 patients with essential hypertension. Since the calcium content is lower in these subjects, the K/Ca ratio is increased. Instead of the normal 1.70-2.15, the figures obtained ranged from 2.08 to 2.97. The same change was observed in asthma, gastric ulcer and other vegetative neuroses.

Extracts from Bilberry in Pancreatectomized Dogs.—Eppinger, Mark and Wagner succeeded in lowering the blood sugar and glycosuria in pancreatectomized dogs by oral administration of an extract from bilberry leaves. The action depends, however, on some other circumstances, for the blood sugar increased at times.

Herpes Zoster and Chickenpox.—Lauda and Silberstern had negative results with complement fixation in herpes zoster when using an antigen from chickenpox. They suggest that the positive results obtained by French workers might be due to an epidemic of zoster of chickenpox origin in Paris.

Syphilis and Tuberculosis.—Liek had been irradiating without results a man diagnosed by an authority as suffering from tuberculosis of the skin. The patient had a negative Wassermann reaction and a negative history, but recovered under arsphenamin treatment. A young girl of good family, referred for irradiation of supposedly tuberculous lymph glands in the neck, had a primary sclerosis on the labium majus, which was soon followed by a roseola. He quotes other similar cases of diagnostic mistakes, especially in children with real or supposed surgical tuberculosis.

Medizinische Klinik, Berlin

21: 1445-1484 (Sept. 25) 1925

*Increased Frequency of Hyperthyroidism. J. Wiesel.—p. 1445.
*Mineral Waters in Therapeutics. Wiechowski.—p. 1448.
Symposium on Surgical Treatment of Cancer of the Rectum. O. Nordmann et al.—p. 1451. C'td.
*Insulin Treatment of Exophthalmic Goiter. P. F. Richter.—p. 1454.
*Fattening of Nondiabetics with Insulin. R. Bauer and W. Nyiri.—p. 1454.
Intestinal Changes in Paratyphoid. L. Pick.—p. 1458.
*Influence of Ice-Bag on Gastric Secretion. Von Friedrich.—p. 1461.
Nephrosis in Cases of Joint Disease. Ehrmann and Taterka.—p. 1462.
*Transmission of Herpes Virus to Mice. Luger and Erdstein.—p. 1465.
*Interdigital Eczema. F. Pinkus.—p. 1469.
Recent Works on Cancer. O. Strauss.—p. 1471. C'en.
The Rockefeller Institute. W. Levinthal.—p. 1480. C'en.
Tuberculosis of Female Sex Organs. O. Pankow. Supplement.—pp. 1-43.

Increasing Prevalence of Thyroses in Vienna.—Wiesel finds an increased frequency of goiter (especially exophthalmic) and of hyperthyroidism in Vienna. He attributes many of the cases to the indiscriminate use of iodin. He has noted that symptoms of exophthalmic goiter are frequently combined in young girls with chlorotic blood changes.

Pharmacology of Mineral Waters.—Wiechowski observed changes of temperature, coagulation time, and of the reaction to inflammatory stimuli and magnesium anesthesia in animals

drinking Carlsbad water over a long period. It is possible that such waters act by changing the mineral metabolism of the organism.

Insulin Treatment of Exophthalmic Goiter.—Richter recommends small doses of insulin in treatment of exophthalmic goiter. He injects 5 units twice daily, later 2.5 units.

Fattening of Nondiabetics with Insulin.—Bauer and Nyiri had excellent results, in underweight persons, with insulin injections. They administered on the first day 5 units twice daily; on the second day 10-15 units, and, beginning from the third day, 20 units. In the second week, 3 injections of 20 units were given daily, together with food representing 60 calories per kilogram of body weight. The average diet contained usually over 100 gm. of proteins; 100-150 gm. of fat, and 250-400 gm. of carbohydrates. The appetite soon began to increase.

Influence of External Application of Ice on Gastric Secretion.—Von Friedrich found that an ice bag applied externally for three hours did not modify the secretion in the stomach.

Transmission of Herpes Virus to Mice.—Luger and Erdstein produced easily encephalitis in mice by intracerebral inoculation of herpes virus. The degeneration of the oxychromatin was perhaps more distinct than in rabbits.

Treatment of Skin Diseases.—Pinkus deals with so-called interdigital eczema. It is in reality a mycosis, as Kaufmann found, although Sabouraud had preceded her in showing that a large proportion of the so-called dyshidrotic eczemas are parasitic affections. He advises drying the skin between the toes, and washing only with diluted alcohol.

Münchener medizinische Wochenschrift, Munich

72: 1625-1670 (Sept. 25) 1925

*Silver Chlorid Coating for Silicic Acid. H. Bechhold.—p. 1625.
Hard Spots in Leg Muscles. F. Lange.—p. 1626.
*Etiology and Pathogenesis of Sciatica. O. Klein.—p. 1629.
The Passing of Chlorosis. A. Hoffmann.—p. 1630.
Treatment of Uterine Myomas. M. Flesch.—p. 1632.
A Syphilis Reaction with Active Serum. Jourdan.—p. 1634.
*Garlic Treatment of Dyspepsia. E. Roos.—p. 1637.
Pharmacology of Garlic. P. Noether.—p. 1641.
Standard Splint for Fractures of the Leg. Rogge.—p. 1642.
Modern European and Old Indian Embryology. A. M. Esser.—p. 1643.
Medicine in the United States. L. Schönbauer.—p. 1645. C'cn.
Sport Injuries. G. Rosenburg.—p. 1647.
Symphyseotomy. F. Benzel.—p. 1651.

Silver Chlorid Coating for Silicic Acid.—Bechhold tested the adsorptive and disinfecting power of silicic acid coated with silver chlorid. It was superior to the best charcoal.

Etiology and Pathogenesis of Sciatica.—Klein confirms in sciatica the frequency of pathologic changes in the territory innervated by the sciatic nerve. This supports Lindstedt's theory as to the reflex origin of the disease.

Garlic in Treatment of Intestinal Diseases.—Roos had good results with a preparation of garlic in ninety-six patients suffering from diarrhea and dyspepsia.

Zentralblatt für Gynäkologie, Leipzig

49: 2177-2224 (Sept. 26) 1925

Classification and Prevalence of Certain Ovarian Tumors. E. Stübler and T. Brandess.—p. 2178.
Acute Ulcer of the Vulva. P. Schugt.—p. 2180.
Retro-Inguinal Alexander-Adams Operation. E. Solms.—p. 2185.
*The Acid Titer of the Vaginal Secretion. F. Heinlein.—p. 2194.
Cauliflower Carcinoma of the Cervix. E. O. Schoch.—p. 2204.
Thoracopagus Tetrabrachius. A. Irsa.—p. 2206.
*To Facilitate the Alexander-Adams. H. Friedrich.—p. 2212.

The Reaction of the Vaginal Secretions During Pregnancy.—Heinlein's research failed to confirm the alleged cyclic fluctuations of the acid titer, but he found wide variations at different times in the same person.

The Alexander-Adams Operation.—Friedrich lays a forceps on the median line, to touch the symphysis' upper margin. A second forceps is then placed over the upper margin of the superior ramus of the os pubis, the tips of the instruments touching at the median line. They form a right-angled triangle, and he makes his incision exactly through the center, beginning 1 cm. from the angle of the triangle. By this means the inguinal ring is opened up without fail, and ample access is obtained for the Alexander-Adams operation. The incision is continued to the limit of the hair. The incisions are thus symmetrical, immaterial whether the women are lean or stout.

Časopis lékařů českých, Prague

64: 1357-1392 (Sept. 19) 1925

*High Colpocleisis. G. Müller.—p. 1357.
Pseudochylous Ascites in Lipoid Nephrosis. V. Ulrich.—p. 1362.
*Venous Pressure. R. Tatterová and J. Serf.—p. 1364.
Sedimentation Test. A. Fürst.—p. 1371.
The Pirquet Test in Young Children. M. F. Skalník.—p. 1375. C'td.
Criticism of Gye's Discoveries. R. Kimla.—p. 1379. C'cn, p. 1414.
Survey of Czech Literature on Microbiology. G. Gellner.—p. 1381.

High Closure of the Vagina in Operative Treatment of Vesicovaginal Fistula.—Müller advises to return to high colpocleisis in cases of extensive communication between the bladder and the vagina if the capacity of the bladder is reduced. Supravaginal amputation of the uterus or roentgen castration might be added, to prevent formation of calculi.

Venous Pressure.—Tatterová and Šerf obtained in fifty-six patients practically identical results with Pruche's indirect method and with the direct method. Venous hypertension was observed in auricular fibrillation, mitral disease, exophthalmic goiter, syphilitic aortitis and nephritis. Patients with arteriosclerosis of the kidneys had no increased pressure. Electrocardiograms showed in venous hypertension with mitral disease or exophthalmic goiter a predominance of the right ventricle; in nephritis, the left ventricle predominated.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

2: 1215-1310 (Sept. 12) 1925

Medical Education in Europe. Comment on Flexner's Book. G. van Rijnberk.—p. 1216. C'td.
*Research on the Bacteriophage. L. K. Wolff.—p. 1220.
*Muscle Tonus and Foot Reflexes. J. W. Langelaan.—p. 1223.
Influence of Semicircular Canals on Gait. P. de Haan.—p. 1238.
Appendicitis in Right Femoral Hernia. Gouwe.—p. 1247.

Bacteriophage Action by Trypsin.—Wolff states that trypsin loses its bacteriophage-like action when diluted to 1:200, while the bacteriophage is still active at this dilution, even after adsorption by kaolin. Heating trypsin abolishes the bacteriophage-like action, while heating scarcely modifies the true bacteriophage action. Other tests have all given concordant findings, he says, suggesting that the bacteriophage-like action of trypsin is due in reality to the actual presence of the bacteriophage in the trypsin. This has been d'Herelle's contention from the first, while others have hailed this action of trypsin as evidence that the bacteriophage is of ferment nature.

Muscle Tonus and the Foot Reflexes.—Langelaan presents arguments to show that the muscular contraction is due to a reflex mechanism, and that the foot reflex is independent of the sympathetic fibers innervating the muscle. The foot reflex persists even after corresponding ramisection. This conception of the mechanism of the foot reflex allows estimation of the latent period and formulation of certain purely physical constants from study of the living muscle.

Ugeskrift for Læger, Copenhagen

87: 791-814 (Sept. 10) 1925

*Nonspecific Protein Therapy. Christoffersen and Polack.—p. 791.
Case of Multiple Cartilaginous Exostoses. Østergaard.—p. 795.
*Masculine Pseudohermaphroditism. P. Dahl.—p. 796.
Dislocation of Both Semilunar Bones. K. Winge.—p. 797.
Expenditures of 350 Danish Families in 1922. Heiberg.—p. 803.

Protein Therapy.—Christoffersen and Polack tabulate the findings in forty three cases of various affections treated with parenteral injection of different proteins. The best results were attained in acute rheumatism and acute hepatitis, and with injections of milk in all the various affections. No benefit was apparent in chronic rheumatism. The only contraindication they admit is a tuberculous process; the protein injection might cause a serious focal exacerbation.

Pseudohermaphroditism.—The mistake in the sex was revealed when epididymitis developed in the supposed young woman. She was contentedly married, and had been sent to the hospital with the diagnosis of incarcerated hernia. No uterus or adnexa could be found.